HIV Risk Behaviours Among Canadians: An Inventory and Synthesis

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Executive Summary

At the end of 1996, there were an estimated 36,000-42,000 Canadians living with HIV infection. The number of new HIV infections that occurred in Canada in 1996 is estimated to be between 3,000 and 5,000, which is higher than the estimated average number of 2,500-3,000 per year for the period 1989-94. The majority of this increase in HIV infections appears to be occurring among injection drug users who now make up nearly half of all new infections. However, men who have sex with men still constitute a significant proportion of new infections, and available data also suggest that HIV infections are increasing among non-IDU heterosexuals (especially women).

With the incidence of new HIV infections increasing since the early 1990's and the fact that there is no vaccine for HIV, this means that behaviour change is more important than ever as the main tool for HIV prevention. Behaviour change concerns both those who are HIV infected and those uninfected, and primarily relates to sexual behaviour and drug injection behaviour. Information on the levels of these behaviours is needed to predict new groups at potential risk for HIV infection, to set realistic goals for behaviour change, and to guide and evaluate HIV prevention programs in Canada.

Many adolescents are at risk for HIV infection. Many have had sexual intercourse, with percentages ranging from 8-14% of grade seven students to 56-66% of grade twelve students, and to more than 80% of street youth. Median age at first intercourse is higher in school-based populations (14-16 years) than in street youth (12-15 years). Of those adolescents who are sexually active, many have had more than one partner. For example, in a Nova Scotia study (1996), among grade 10 students who had had sexual intercourse, 36% reported having two or more partners in the 12 months prior. Among Ottawa street youth (1993), over 20% had four or more partners in the year prior. In the majority of studies on the sexual behaviour of adolescents, less than half of those who are sexually active use condoms consistently and condom use appears to be lower among older adolescents than younger ones. Among street youth, use of injection drugs is a concern, with studies reporting that 3.4% to 10.2% of street youth have ever used injection drugs.

Among adults, 4-16% have had multiple partners in the year prior. Many do not use condoms on a regular basis and, as in other groups, condom use is more frequent with casual partners than with regular partners. Three to 6% report having had anal intercourse in the year prior. Although commercial sex trade activity, injection drug use and history of STD are not common among the general population, even the small percentages reported translate into a substantial number of people at risk for HIV infection.

Among injection drug users, 30-50% have borrowed needles in the six months prior and this is a very high rate compared to countries such as Switzerland where the comparable rate is around 10%. The majority of respondents in studies of IDU have had multiple sexual partners. In one

cohort study, 51% of men and 76% of women had two or more partners in the six months prior. More than half of IDU do not use condoms with their regular partners and this is particularly concerning as most report multiple partners. Many female IDU have sex trade partners, with percentages ranging from 20 to 60%.

The majority of MSM report having multiple partners and data suggest that there has been a decrease in the mean number of sex partners in the year prior, at least when comparing the 1980s to the 1990s. No clear trend is evident for unprotected receptive anal intercourse, but this continues to be a common activity practised at least once with about 30-40% of regular and 10-20% of casual partners in the year prior. Bisexual behaviour is a concern for HIV transmission to women with a substantial number of MSM reporting unprotected intercourse with female partners.

The available data suggest that many Canadians are engaging in behaviours that place them at risk for HIV-infection and other STDs. However, it is difficult to assess trends in levels of risk behaviour because the data have been collected using different variable definitions and varying time frames. Without standardized, comparable data, it is difficult to use risk behaviour information to help evaluate the effectiveness of prevention programs. One strategy to improve the comparability and interpretation of data would be to develop standardized questions on HIV-associated risk behaviour and to encourage their use by Canadian researchers.

There is a number of areas in which more information is needed. These include condom use (by partner type and by type of sexual activity), the relation between HIV testing and subsequent behaviour change, and the relation between specific behaviours and sexual networks. Such information collected at regular intervals in a standardized manner would go a long way to help target and evaluate HIV prevention programs and policies in Canada.

INTRODUCTION

The Bureau of HIV/AIDS, STD and TB, LCDC, Health Canada, has estimated that at the end of 1996, there were 36,000-42,000 Canadians living with HIV infection and that a cumulative total of 50,000-54,000 Canadians had been infected with HIV since the onset of the epidemic (including those who have died of HIV/AIDS)[1]. The number of new HIV infections that occurred in Canada in 1996 is estimated to be between 3,000 and 5,000, which is higher than the estimated average number of 2,500-3,000 per year for the period 1989-94. The majority of this increase in HIV infections appears to be occurring among injection drug users who now make up nearly half of all new infections (49% in 1996 compared to 24% in 1987-90 and less than 10% before 1986). Although there has been a steady decline in the proportion of men who have sex with men (MSM) among new infections (from over 80% during 1981-83 to 50% in 1987-90 and to 37% in 1996), MSM still make up a significant proportion of new infections. There were an estimated 4600 women living with HIV infection at the end of 1996 and women were estimated to make up about 20% of new HIV infections in Canada in 1996, an increase from 14% in 1987-90 and less than 10% before 1986.

This unsettling information that the incidence of new HIV infections has increased since the early 1990's means that we are clearly facing a serious challenge in terms of HIV prevention in Canada. The main tool for preventing HIV infection is behaviour change, both among those who are HIV-infected and among those who are not HIV-infected. Among those who are HIV-infected, the key issues are whether the person is aware of their HIV status and whether they have modified their behaviour in relation to this knowledge. Among those who are uninfected, the key issue revolves around those at risk modifying their behaviour to avoid infection.

The main behaviours of interest are sexual behaviour (both homo- and heterosexual) and drug injection behaviour and their related risk factors such as age at first intercourse and history of sexually transmitted diseases (STDs). It is this behavioural information that is needed to predict new groups at potential risk for HIV infection, to set realistic goals for behaviour change, and to guide and evaluate HIV prevention programs in Canada.

Accordingly, the purpose of this report is to present a synthesis of available information on the levels of HIV-associated risk behaviour in Canada. This report is organized by risk group and includes: adolescents (school-based and street youth), adults (general population), injection drug users (IDU), and men who have sex with men (MSM). To a large extent, the organization of each of the individual sections has been dictated by the type of information available and the nature of the group being described. For example, although all sections contain information on drug use, the section on IDU contains detailed information about the sharing of injection equipment. As well, all sections contain information about sexual behaviour such as information on number of sexual partners, anal intercourse, oral intercourse, and condom use. The section on adolescents, however, also contains information on percentage of respondents who have had sexual intercourse and their age at first intercourse. The sections on adolescents and adults

include information on STD history, but because of limited information, the sections on IDU and MSM do not include information on STD history.

It is worth noting that all of the studies summarized here provide information on reported rather than observed behaviours, for obvious reasons. The validity of self-reported information is a potential limitation as there may be biases such as recall errors or social desirability bias in the reporting of such sensitive behaviours (see Catania, Gibson, Chitwood & Coates for an excellent discussion) [2]. However, the literature suggests that such reported data are reasonably accurate [3-6].

This report represents the beginning of a process, as much of the risk behaviour information in Canada is unpublished and one of the purposes of this report is to stimulate discussion on this topic and to work toward a more complete inventory of available studies. This report also serves to highlight gaps in existing knowledge and to stimulate further work to better understand the complex behaviours that place Canadians at risk for HIV infection.

HIV Risk Behaviours Among Adolescents in Canada

A number of studies have been done in Canada examining levels of risk behaviour among adolescents. There are no standardized age limits to define adolescence, but it is generally defined as the period between childhood and adulthood and usually ranges from about 13 years of age to 19 years of age (and in some cases, up to 24 years of age). For the purposes of presenting information on risk behaviours among adolescents we have included studies conducted in schools (grade levels range from grade 7 to university level), studies among street youth (ranging in age from 12 to 20 years of age), and for general population studies, we have included data for those 15 to 19 years of age. The list of studies reviewed is presented in Table 1 and includes year of study, method of recruitment, and number and age-range of respondents.

Sexual Behaviour

Proportion who have had sexual intercourse

For each study, percentages of those having had sexual intercourse is presented in Table 2. In about half the studies, the definition of sexual intercourse used in that particular study was not provided. The proportion of those reporting having had sexual intercourse ranges from 8% (grade-seven girls in BC, 1992, and grade-seven students in Newfoundland/Labrador, 1996 and PEI, 1996) to 98% (Vancouver street youth, 1993). Because some studies report data for different grade levels and some provide data only for the sample as a whole, it is difficult to make comparisons across all studies. Despite this, these data clearly indicate that a substantial proportion of adolescents have had sexual intercourse. It is less clear, however, whether there has been any change over time in the proportion in a particular grade reporting sexual intercourse. Considering data for grade-nine students, this proportion was 21-31% in the Canada Youth and AIDS study (CYAIDS; 1988), 20-28% in the BC study (1992), 21% in the PEI study (1996), and 25% in the Newfoundland/Labrador study (1996). However, the interpretation of these numbers is difficult as the studies are in different regions and do not all provide a breakdown of the data by gender. Thus, it is difficult to say if there has been any change in the proportion reporting ever having had sexual intercourse. Among grade-eleven students (who are mostly 16 to 17 years of age), 49% of boys and 46% of girls in CYAIDS study (1988) compared to 46% of boys and 43% of girls in the BC study (1992) reported ever having had sexual intercourse. Among 15-19 year olds, 60% of boys and 56% of girls in the Health Promotion survey (1990) compared to 62% of boys, and 45% of girls in Canada Health Monitor 1995 (CHM 1995) report having had sexual intercourse. This suggests that there may have been a decline in the proportion of girls reporting sexual intercourse, but it should be noted that the sample size in the CHM 1995 was relatively small and the comparison is not age-adjusted. Among street youth, it appears that almost all respondents report having had sexual intercourse; three out of four studies indicate that over 90% of respondents had ever had sexual intercourse.

There does not appear to have been any changes over time in the proportions of street youth reporting ever having sexual intercourse.

Age at first intercourse

Information on age at first intercourse (AFI) is presented in Table 3. Two studies report only the mean AFI and the others report the distribution of the AFI. It should be noted that because percentages are only of those who have had sexual intercourse and do not include those who have not had sexual intercourse, the estimate of AFI will be an underestimate.

For school-based and general population surveys the median AFI ranges from 14 (BC Adolescent Health, boys aged 15 to 19 years in the CHM 1994) to 16 years of age (HPS 1990, boys 15 to 19 years old in CHM 1997). For street youth and other studies, the median AFI ranges from 12 (girls in the Vancouver street youth study) to 15 years of age (Alberta STD study, 1994). There does not appear to be any substantial change over time in the AFI among adolescents in the general population, nor among street youth. It does appear, however, that street youth begin to have intercourse at an earlier age than do non-street youth.

Number of sexual partners

The distribution of reported number of sexual partners among adolescents is presented in Table 4. Some studies report number of partners in lifetime, some for the year prior and two report number of partners for the three months prior. With the exception of the NPHS (1994) which did not inquire whether or not respondents had ever had sexual intercourse, number of partners is reported only for those who have had sexual intercourse, either in their lifetime or in the year prior to the survey. The CHM 1997 asks specifically about vaginal intercourse with opposite-sex partners; for all other studies, neither gender of partner, nor type of intercourse are specified.

These studies show that among those who have had sexual intercourse, a substantial proportion have had more than one sexual partner. For example, among those who had ever had sexual intercourse, in the CYAIDS study (1988), 77% of boys and 64% of girls had two or more partners over their lifetime and in the Nova Scotia survey (1996), 40% of grade 12 students and 36% of grade 10 students had two or more partners in the 12 months prior to the survey. Among Ottawa street youth (1993) who had sexual intercourse, 21% of boys and 26% of girls had four or more partners in the year prior to the survey.

When considering school-based and general population studies that ask respondents about number of partners in their lifetime, among boys, it appears that the percent reporting six or more partners may have declined. For example, 36% of boys in the CYAIDS study (1988), 19% in the BC study (1992), and 10% in the CHM 1997 report six or more partners. The pattern among girls is more difficult to interpret than that among boys; 21% of girls in the CYAIDS study

(1988), 12% in BC (1992), and 28% in the CHM 1997 report six or more partners.

When comparing data for studies that ask about the number of sexual partners in the prior year, no clear trend emerges among boys. For boys in the HPS 1990, CHM 1994, NPHS 1994, and Nova Scotia (1996) studies, 18%, 21%, 25%, and 20%, respectively, had three or more sexual partners in the year prior. Among girls, in the HPS 1990, CHM 1994, NPHS 1994, and Nova Scotia (1996) studies, 4%, 12%, 12% and 17%, respectively, had three or more partners, which is suggestive of an increase in the proportion reporting multiple partners.

Street youth are more likely to have multiple partners than are non-street youth. For example, 41% of boys and 37% of girls in the Vancouver street youth study (1993), compared to 10% of boys and 4% of girls in the BC school-based study (1992) had more than two partners in the three months prior to the study. Comparing the SYAIDS (1988) in which 47% of boys and 41% of girls had more than ten partners in their lifetime to the Montreal street youth study (1994) in which 28% of boys and 19% of girls had more than ten partners, suggests that there may have been a decline in partner number among street youth. Because the Vancouver street youth study (1993) reports the percent of respondents having more than five partners in their lifetime and the Ottawa street youth study (1993) reports the percent of those having more than three partners in the year prior, it is difficult to compare these with the other street youth studies.

Because of a lack of standardization, it is very difficult to determine if there has been a change in the proportion of adolescents reporting multiple partners. Nevertheless, it is clear that substantial proportions of adolescents, particularly street youth, report having multiple sexual partners.

Anal intercourse

Few studies inquire about anal intercourse (penis-in-anus intercourse). None of the school-based surveys inquire directly about this behaviour (although the Nova Scotia, PEI, and Newfoundland/Labrador surveys explicitly define intercourse as anal or vaginal penetration) and this is most likely because questions on anal intercourse are considered too sensitive for a school setting.

Three general population surveys (CYAIDS 1988, CHM 1994, and CHM 1997) inquired specifically about anal intercourse and this information is presented in Table 5. Percentages reporting anal intercourse range from 2.1% of boys in the CHM 1997 who report it for the 12 months prior, to 20% of female dropouts in the CYAIDS study (1988) who reported ever having had anal intercourse. It appears that the proportion reporting anal intercourse is somewhat higher among street youth and STD-clinic attenders than it is among the general population with proportions reporting ranging from 7% of boys attending STD clinics (Alberta STD clinic, 1994) to 24% of female street youth (SYAIDS, 1988).

As anal intercourse is an important potential risk factor for HIV infection, it is unfortunate that

there is not more information available on its practice. Of the six studies reported here that inquire about anal intercourse, three do not specify whether the male respondents had anal intercourse with same or opposite-sex partners. Because anal intercourse between males is potentially high risk, with receptive anal intercourse being more high risk[7], it is important to have information available on partner gender. For women, anal intercourse is of greater potential risk than is vaginal intercourse [8], therefore it is important that studies asking about sexual intercourse distinguish between vaginal and anal intercourse.

The information that is available suggests that a sizeable proportion of adolescents have engaged in anal intercourse. More information is needed about the proportion of adolescents who engage in anal intercourse, the proportion of those who use condoms when doing so, and for males, the gender of their partners.

Oral intercourse

Only four studies report information on oral intercourse (penis-in-mouth, or mouth-on-vagina). This lack of information on oral intercourse may be partly due to the fact that only recently has oral intercourse been seriously considered as a risk factor for HIV infection [9,10] and also because, with respect to adolescent surveys in particular, questions on oral intercourse may be considered too sensitive.

Among general population and school-based studies, two inquired about oral intercourse. The CYAIDS study (1988) reports that for boys, 73% of dropouts and 68% of college/university students had oral intercourse at least once in their life (not specified whether receptive or insertive). For girls, (CYAIDS, 1988) 64% of dropouts and 64% of college/university students had oral intercourse at least once. In the CHM 1994, 24.3% of all male respondents aged 15 to 19 years reported giving oral sex to a woman in the year prior and 33.1% had received oral sex from a woman, and among women aged 15 to 19 years, 32.9% had received oral sex from a man and 31.1% had given oral sex to a man in the year prior.

In the SYAIDS study (1988), 81% of respondents reported having oral intercourse at least once in their life. Among respondents in the Montreal street youth study (1994), 63% of boys and 56% of girls reported having had oral intercourse, and 1.9% of boys and 7.4% of girls had oral intercourse with client partners (partners who were paying the respondent for sex). The Montreal study was the only one of the four that presented data on condom use with oral sex. Of those who had oral intercourse with a person of the opposite sex, 9% of boys and 7% of girls used condoms. Of those who had oral intercourse with client partners, 34% of boys and 43% of girls used a condom or other barrier when having oral intercourse.

The proportion of respondents reporting oral intercourse is fairly high and does not appear to differ between street youth and non-street youth.

Same-sex behaviour

Only four surveys inquired specifically about same-sex partners. This is likely because it is considered fairly sensitive and could involve questions about oral and anal intercourse which are also sensitive issues for adolescents. Among SYAIDS (1988) respondents, 19% of boys and 13% of girls indicated that they had had at least one same-sex partner in their lifetime. The type of sexual contact between the partners was not specified however, therefore it is not clear how many of these respondents had engaged in either oral or anal intercourse. In the Montreal street youth study (1994), among boys who had ever had sex, 1.3% reported having insertive anal intercourse and 0.5% reported receptive anal intercourse with another male. Also in this study, 42 boys (2% of all males, 2.3% of sexually active males) and 17 girls (1.8% of all females, 2.2% of sexually active females) reported same-sex contact (defined as oral or anal penetration). In the CHM 1994, none of the respondents aged 15 to 19 years reported having sex with someone of the same sex. In the study of BC young offenders (1994), 1.1% of boys and 5.8% of girls reported same-sex activity. More information is needed on same-sex behaviour among adolescents, and because anal intercourse is a higher risk activity than oral intercourse, more specific definitions of "same-sex activity", particularly among boys, should be provided.

Condom Use

Data on reported condom use are presented in Table 6. Some studies asked about condom use at last intercourse, and others asked about average condom use over a specified time period. Most of the studies report on the percentage who always use condoms and most do not distinguish between anal intercourse and vaginal intercourse when reporting on condom use.

In the majority of studies among the general adolescent population, less than half of the respondents reported that they always use condoms. The lowest rate of always-use was reported in the CYAIDS study (1988) in which 6 to 19% always used. The results of the studies done in the Nova Scotia (1996), PEI (1996), and in BC (1992) in which condom use is reported by grade level, suggest that condom use decreases with age. For example, in the BC study, among girls, 64% of grade-seven students, compared to 45% of grade-twelve students used a condom at last intercourse, and among students in the Nova Scotia study, 49.9% of grade-ten compared to 32% of grade 12 students reported "always" using condoms.

It is not clear whether frequency of use differs between general population/school based studies and studies among street youth. For those studies that distinguish between casual and regular partners (Montreal, Ottawa, and Alberta), reported condom use is higher with casual partners than with regular partners. For example, in the Ottawa street youth study 1993, 47% of boys and 29% of girls "always" used condoms with a regular partner, compared to 65% of boys and 55% of girls who "always" used condoms with a casual partner. Overall, consistent condom use appears to be rather low, except in the NPHS (1994) study in which 70.9% of boys (who were

married or living with someone and had more than that one partner, as well as those who were single with one or more partners) reported "always" using condoms.

As with other risk behaviours, it is difficult to make comparisons across studies. Although condom use may have increased somewhat since the CYAIDS (1988) and the SYAIDS (1988) studies were conducted, a substantial proportion, more than half, are not using condoms consistently.

Sex trade activity

In the Montreal street youth study (1994), 2.2% of boys and 9% of girls reported ever having engaged in prostitution. Of all respondents, 1% of boys and 9% of girls had vaginal intercourse with a client; 1% of boys had insertive anal intercourse with a client; and 1% of boys and 2% of girls had receptive anal intercourse with a client. Among Ottawa street youth (1993), 6.6% of boys and 17.9% of girls had exchanged sex for drugs, money or shelter in the year prior to the study. In the Alberta STD study (1994), 3.3% of boys reported taking money for sex in the last 12 months, and 0.5% had exchanged sex for drugs in the last 12 months. Among girls, 5.7% exchanged sex for money and 2.5% exchanged sex for drugs. Of those interviewed in the BC young offenders study (1994), 3.7% of boys and 21.2% of girls reported ever having sex for trade.[a]

A fairly high proportion of street youth, especially female street-youth, report involvement in the sex-trade. As a comparison to the general population, among respondents aged 15 to 19 years in the CHM 1994, none of the girls reported receiving money or drugs for sex, and 1.8% of boys report having ever paid for sex with a woman.

Other risk factors

Among BC young offenders (1994), 19% of girls and 4% of boys reported ever having sex with an injection drug user (time period not given). Among those in the Montreal street youth study (1994) who had had sexual intercourse, 10% of boys and 22% of girls reported ever having a risky sexual partner (IDU, MSM, prostitute, HIV positive) in their lifetime.

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[a] In the SYAIDS study, 13.9% of all respondents (11.3% of and 17.1% of girls) worked in the sex industry and described themselves as prostitutes. However, they were specifically targeted for sampling and so cannot be used to make inferences about the proportion of street youth who engage in sex-trade activities.

History of Sexually Transmitted Disease (STD)

STDs are important as they are markers of sexual risk behaviours and some facilitate HIV transmission [11,12]. Percentages reporting a history of STD are presented in Table 7. Among respondents to general population surveys, the percent reporting having had an STD ranges from zero percent of boys in the CHM 1997 who report having had an STD in the prior five years, to 12% of female dropouts in the CYAIDS study (1988) who report ever having had an STD. The proportion reporting an STD is higher among street youth and clients of STD clinics than among the general population. Proportions reporting an STD range from 4.9% of boys in the Ottawa Street youth study (1993) who ever had an STD to 30% of girls in SYAIDS study (1988) who ever had an STD. The proportion of adolescents, particularly street youth, reporting a history of STD is of concern as it indicates that high numbers of youth are engaging in unprotected sex.

Injection Drug Use

Twelve percent of those in the SYAIDS street youth study (1988) had ever used injection drugs and half of these reported ever sharing needles. In the Montreal street youth study (1994), 6.4% of girls and 4.5% of boys reported IDU in their lifetime. Among BC young offenders (1994), 3.4% of boys and 10.2% of girls had used injection drugs (time period not given). In CHM 1994, 1.8% of boys (and all of these had injected within the 12 months prior) and none of the female respondents reported ever having injected drugs. In the Nova Scotia survey (1996), 1.6% of all respondents reported using injection drugs in the 12 months prior to the study. In the CHM 1997, 3% of boys and 0.9% of girls report ever injecting non-prescription drugs.

Injection drug use appears to be more common among street youth than among school-based adolescents. Use of injection drugs as well as the sharing of needles and other equipment among adolescents is an area that needs to be monitored, particularly among street youth.

HIV testing

Among 15 to 19 year-old respondents to the CHM 1994, 9.3% of boys and 15.3% of girls had been tested for HIV; of these, 67% of boys and 78% of girls had been tested within the year prior. In the NPHS (1994), among respondents aged 15 to 19 years, 10.7% of boys and 15.2% of girls had been tested for HIV. Of respondents to the CHM 1997, 8.2% of boys and 19.6% of girls had ever been tested for HIV.

Discussion

Major observations and conclusions

There is a fairly substantial amount of data available on the levels of risk behaviours reported among adolescents in Canada. These data suggest that because of their behaviours, adolescents, and in particular street youth, are at risk for HIV-infection and other STDs. It appears that at least half of the adolescents surveyed have had sexual intercourse, and of these, many have had multiple partners. Less than half of adolescents reported consistent condom use, and condom use appears to be lower among older adolescents than younger ones. Clearly, prevention messages must be targeted to older adolescents as well as younger ones. Although a minority of adolescents engage in anal intercourse, the proportion is still relatively high; up to one-fifth in certain samples. Among street youth, levels of risk behaviour, including injection drug use are even higher and this is cause for great concern. An alarmingly high proportion of female street youth have engaged in sex-trade activity. It does appear that some risk behaviours may have declined since the CYAIDS (1988) and the SYAIDS (1988) studies (e.g, possibly a slight increase in age of first intercourse for boys, a slight decline in the proportion reporting six or more partners in lifetime, some increase in condom use) but the data are difficult to compare and do not reveal any dramatic declines in levels of risk behaviour.

Limitations of available data

There are a number of limitations of the data that make it difficult to assess trends in risk behaviours among adolescents. First, not all variables are clearly defined across studies. For example, many studies do not indicate how sexual intercourse was defined. Second, the time period for which information was collected varied. Third, samples are not consistent with respect to age. General population surveys did not include adolescents under 15 years of age, whereas the school-based studies employ samples with a broader age range. Because respondents to general population surveys were sampled on the basis of age, and respondents in school-based studies were sampled on the basis of grade, it is difficult to make comparisons. As well, recruitment methods varied with general population surveys being conducted by random-digit dialling, compared to in-class school-based surveys, or to methods used to recruit street youth (e.g., convenience samples of those who frequented a particular drop-in centre). Clearly, better standardization of information collection would lead to an improved ability to make meaningful statements about trends in risk behaviours. Finally, as with the majority of sexual behaviour data, the data presented are self-report, and are of course, subject to reporting bias caused by such phenomena as recall accuracy and social desirability.

Specific data needs

Despite the amount of information available on risk behaviours among adolescents, more comparable data need to be collected. Most studies reporting on condom use do not specify gender of partner nor do they distinguish between different types of intercourse. More also needs to be learned about same-sex contact such as whether it involves oral intercourse or anal intercourse. As well, very little is known about condom use during anal intercourse, and finally, there is very little information available on risk behaviours among adolescents who are not in school nor living on the street.

Table 1: Inventory of studies on HIV-associated risk behaviours among Canadian adolescents and studies from which information on adolescents was extracted			
Study and year of data collection	Investigators	Sample description and how recruited	Sample size and gender distribution
School Based Surveys and General Population Surveys that included 15 to 19 year -olds			
CYAIDS 1988[13]	King A, Beazley R, Warren W, Hankins C, Robertson A, Radford J.	school-based, grades 7, 9 , 11, drop-outs, college/university	n = 38,002 47% boys
Canada's Health Promotion Survey, 1990[14]	Health Canada, Stephens T, Fowler Graham D. (Eds).	random digit dialling (RDD) telephone survey, respondents aged 15 and older, data extracted for 15-19 year olds	for 15-19 year olds, N = 1010 49.3% boys
Santé Québec, 1991[15]	Gouvernement du Québec	random-digit-dialling (RDD) telephone survey, 15-29 year olds, data extracted for 15-19 year olds	N for 15-19 year olds not known, for 15-29 year olds N = 3000, 51% males
BC Adolescent Health Survey, 1992[16]	McCreary Centre Society	school-based, grades 7 to 12	N = 15,549, gender distribution not indicated
Canada Health Monitor (CHM), 1994[19]	Division of HIV Epidemiology, Health Canada	Canada-wide RDD telephone survey, respondents aged 15 and older, data extracted for 15-19 year olds	for 15-19 year olds, N = 139 49.6% boys
National Population Health Survey, 1994[18]	Bureau of HIV/AIDS & STD, Health Canada	longitudinal survey, respondents aged 12 and over, data extracted for 15-19 year olds	for 15-19 year olds, N = 905 52.4% boys
CHM 1996[19]	Division of HIV Epidemiology, Health Canada	RDD telephone survey, respondents aged 15 and older, data extracted for 15-19 year olds	for 15-19 year olds, N = 213 55.4% boys
Nova Scotia Student Drug Use Survey 1996[20]	Poulin C.	school-based, grades 7,9,10&12, sexual questions asked only of grades 10&12	N = 3,970, about half in grades 10&12 50% boys [a]
Newfoundland & Labrador Student Drug Use Survey 1996[21]	Government of Newfoundland & Labrador	school-based, grades 7,9,10&12	N = 3,613 50.8% boys
PEI Student Drug Use Survey 1996[22]	Dept of Health and Human Services, PEI	school-based, grades 7,9,10&12	N = 3,062 47% boys

[a] Entire sample was 50% male but exact gender breakdown for grades 10&12 not provided

Table 1 (continued): Inventory of studies on HIV-associated risk behaviours among Canadian adolescents and studies from which information on adolescents was extracted			
Study and year of data collection	Investigators	Sample description and how recruited	Sample size and gender distribution
CHM 1997[23]	Division of HIV Epidemiology, Health Canada	RDD telephone survey, respondents aged 15 and over, data extracted for 15-19 year olds	for 15-19 year olds, N = 195 56.4% boys
Other surveys			
Street Youth and AIDS (SYAIDS), 1988[24]	Radford J, King A, Warren W.	from 10 cities across Canada, mostly through relevant agencies, shelters, some directly from street youth aged 15-20, mean age for boys 17.3, for girls, 16.8.	N = 712 54.9% boys
Montreal youth with maladaptive and social problems, 1991-1994[25]	Frappier J-Y, Roy E.	youth admitted to detention centres and custodial facilities, aged 12-20, mean age for boys 15.6, for girls 15.1	N = 3,089 69.1% boys
Adolescent Health Survey: Street youth in Vancouver, 1993[26]	Tonkin R, McCreary Centre Society	mostly through street workers, some through agencies, street youth aged 12-18	N = 110 50.9% boys
Ottawa street youth, 1993[27]	Tam R, MacDonald N, Feder S, Giglia L, Peeling R, Gully P, et al.	from downtown drop-in centre for street youth, street youth aged 15-20, mean age for boys 17.8, for girls, 17.1	N = 100 61% boys
BC young offenders, 1994[28]	Rothon D, Strathdee S, Cook D, Cornelisse P.	admissions into juvenile correctional system in BC Jan-Apr 1994, young offenders aged 12-19	N =806 83% boys
Alberta STD study 1994[29]	Romanowski B, Campbell P, Preiksaitis J. Fonseca K.	clients of two STD clinics , one in Calgary, one in Edmonton, clients aged 14 and over; data extracted for 14 to 19 year olds	for 14-19 year olds, N = 1,410 40.1 % boys

Table 2: Distribution of percent of Canadian adolescents who have had sexual intercourse at least once[a]

Name of Study/ How sexual intercourse defined	Gender	Gr 7	Gr 8	Gr 9	Gr 10	Gr 11	Gr 12	college/ university	dropout	ages 15-19	all
School based surveys and general population surveys that included 15-19 year olds											
CYAIDS 1988[13]/ definition not provided	M F			31 21		49 46		77 73	89 81		
HPS 1990[14]/definition not provided	M F									60 56	
Santé Québec 1991[15]/intercourse defined as penetration											60
BC Adolescent Health 1992/ definition not provided[16]	M F	14 8	23 14	28 20	34 32	46 43	55 52				33 28
CHM 1994 [17]/includes vaginal, anal, and oral intercourse	M F									51 44	
NPHS 1994[18] not defined[b]											
CHM 1996[19] /defined only as "sex", includes sex between men	M F									61 45	
Nova Scotia[c] 1996[20] /includes vaginal and anal (grades 10 & 12)	M F										48 51
Newfoundland/Labrador 1996[21]		8		25	45		66				36

[a] Percentages are of those who ever had sexual intercourse, unless otherwise indicated

[b] These percentages may be underestimates as respondents were not asked whether they had sexual intercourse but only about their number of sexual partners within the year prior

[c] In this particular study, percentages are for those who had sexual intercourse at least once within the last 12 months; therefore they are likely an underestimate of percentages of those who have ever had sexual intercourse

Table 2 (continued): Distribution of percent of Canadian adolescents who have had sexual intercourse at least once											
Name of Study/ How sexual intercourse defined	Gender	Gr 7	Gr 8	Gr 9	Gr 10	Gr 11	Gr 12	coll/uni	dropout	15-19	all
PEI 1996[22]		8		21	29		53				
CHM 1997[23] (vaginal sexual intercourse)	M F									35 53	
Other studies											
SYAIDS 1988[24]/definition not provided but does not include oral intercourse	M F										95 93
Montreal youth 1991-1994[25] (includes vaginal, anal, and oral intercourse)	M F										85 81
Vancouver Street Youth 1993[26]/ definition not provided	M F										98 98
Ottawa street youth 1993[27]/definition not provided	M F										92 97

Table 3: Median and mean age of first intercourse and distribution of percent of Canadian adolescents who first had intercourse at noted age[a]

	Gender	Median age	Mean age	<10 years	10 to <12 years	12 years	13 years	14 years	15 years	16 years	17-19 years
School-based surveys and general population surveys that include 15-19 year olds											
HPS 1990[14]	M F	15-16 15-16				27 21			52 55		22 23
BC 1992[16]	M F	14 14			14 7	10 7	18 17	17 20	19 24	15 18	7 8
CHM 1994[17]	M F	14 15		0 0	2 4	8 4	18 12	24 20	22 27	18 18	8 15
CHM 1997[23]	M F	16 15		0 0	0 2	0 3	3 10	20 25	17 17	28 33	32 10
Other studies											
SYAIDS 1988[24]		14	12.9M 13.2F	11	10	11	17	21	15	9	6
Montreal 1991-1994 (includes consensual only)[25]	M F		12.8 12.8								
Vancouver street youth, 1993[26]	M F	12 13			27 13	24 23	16 25	9 12	9 19	9 8	5 0
Ottawa street youth 1993[27]	M F		13.8 13.0								
Alberta STD 1994[29]	M F	15 15			8 7		10 10	15 21	22 22	18 24	27 16

[a] Percentages are of those who ever had sexual intercourse

Table 4: Distribution of percent of Canadian adolescents reporting noted number of sexual partners									
	Gender	0	1	2	3	4	5	6-10	11+
School-based surveys and general population surveys that included 15-19 year olds									
in lifetime									
CYAIDS 1988[13], college/university lifetime partners	M F		23 36	12 17	29 26			36 21	
BC Adolescent 1992[16] (lifetime partners)	M F		37 44	33 32		11 12		19 12	
CHM 1997[23] (asked of those who had ever had vaginal sexual intercourse)	M F		42 20	23 18	12 19	4 4	9 11	10 28	
year prior to survey									
HPS 1990[14] (only those who had sex in last year which was 50% of boys, 50% of girls)	M F		64 83	18 13	18 na				
CHM 1994[17] (asked of those who ever had sex)	M F	10 7	55 59	14 22	21 12				
NPHS 1994[18] (includes those who had never had sexual intercourse)	M F	56 58	23 29	10 8	11 5				
NPHS 1994[18] (percent expressed as percent of those who had sexual intercourse in last year)	M F		52 69	23 19	25 12				
Nova Scotia 1996[20]	Gr 12 Gr 10		60[a] 63[b]	20 19	20 17				

[a] Grade 12 students

[b] Grade 10 students

Table 4 (continued): Distribution of percent of Canadian adolescents reporting noted number of sexual partners									
	Gender	0	1	2	3	4	5	6-10	10+
CHM 1997[23] (asked of those who had ever had vaginal intercourse)	M F	7 11	71 45	14 22	8 22				
three months prior to survey									
BC Adolescent Health 1992[16]	M F	41 30	41 59	9 7	10 4				
Other Surveys									
lifetime									
CYAIDS 1988, dropouts[13]	M F		15 23	9 12	28 35			22 17	27 13
SYAIDS 1988 street youth [24]	M F								47 41
Montreal street youth[25]	M F		11 19	37 44				24 18	28 19
Vancouver street youth, 1993[26]	M F		4 2	6 15		11 8		80 75	
year prior to survey									
Ottawa street youth 1993[27]	M F	79 74				21 26			
Alberta STD 1994[29]	M F	1 1	28 28	27 25	12 16	7 9	6 7	14 9	4 4
three months prior to survey									
Vancouver street youth, 1993[26]	M F	15 6	22 39	22 19	41 37				

Table 5: Percent of Canadian adolescents reporting anal intercourse, by gender		
	Boys	Girls
in lifetime		
CYAIDS 1988[13], among those who had ever had sexual intercourse	16% of college/university & 15% of dropouts (gender of partner not indicated)	17% of college/university & 20% of dropouts
SYAIDS 1988[24], among those who ever had sexual intercourse	22% (gender of partner not specified)	24%
Montreal street youth 1991-1994[25], percent of total sample	10% had anal sex with female partners, 0.4% of sample had receptive anal with clients	11% of sample with non-client partners, 1.6% of sample had anal sex with clients
in year prior		
CHM 1994[17], percent of total sample	4.7% (none of the respondents reported same-sex contact)	7%
CHM 1997[23], percent of total sample	2.1% (all female partners, no male partners)	4%
Alberta STD 1994[29], percent of total sample	7% (gender of partner not specified)	13.6%

Table 6: Percent of Canadian adolescents reporting "always use" and "never use" of condoms		
Study / time period	Percent who always use	Percent who never use
CYAIDS 1988[13]/lifetime	university students who "often" have sex: 19% of boys, 11% of girls. School leavers who "often" have sex: 12% of boys, 6% of girls	university students who "often" have sex: 22% of boys, 28% of girls. School leavers who "often" have sex: 23% of boys, 26% of girls
SYAIDS street youth 1988[20]/ lifetime	27% of boys, 25% of girls. Among those who worked in the sex industry: 55% of boys and 58% of girls	32% (boys and girls)
Montreal street youth 1994 [24]/ lifetime	vaginal: 33% of boys, 25% of girls anal sex: 39% of boys, 18% of girls vaginal with client: 41% of boys, 58% of girls insertive anal with male client: 66% of boys receptive anal with male client: 56% of boys, 27% of girls	not reported
Ottawa street youth 1993[27]/year prior	with regular partner: 47% of boys, 29% of girls with casual partner: 65% of boys, 55% of girls	
CHM 1994 [17]/year prior	boys with one partner in prior year, 44%. Of boys with more than one partner, 59.7% with regular (non-live-in)[a] partner, 68.1% with casual partner girls with one partner, 38% , of those with more than one partner - with regular (non-live in) 39.1%, with casual 0%[b]	boys with one partner in prior year, 0%. Of boys with more than one partner, 7.2% with regular (non-live-in)partner, 12.2% with casual partner girls with one partner, 20.7%, among those with more than one partner - with regular (non live-in) 24%
NPHS 1994 [18]/year prior	among single respondents with one partner, and married or cohabitating with more than one partner: 70.9% of boys and 49.4% of girls	among single respondents with one partners and attached with more than one partner: 8.7% of boys, 16.6% of girls
Alberta STD study 1994[29]/year prior	with regular partner: 23.8% of boys, 16.2% of girls with casual partner: 39.8% of boys, 33.2% of girls	with regular partner: 26.4% of boys (regular), 29.7% of girls with casual partner: 9.7% of boys, 13.9% of girls
Nova Scotia 1996[20]/year prior	49.9% of gr 10, 32% of gr 12	14.6% of gr 10, 25.2% of gr 12

[a] Numbers for condom use with spouse or common-law partners are not provided as number of adolescents in such relationships was very small in this sample

[b] Very few girls reported casual partners

Table 6 (continued): Percent of Canadian adolescents reporting "always use" and "never use" of condoms		
Study	Percent who always use	Percent who never use
Newfoundland & Labrador 1996 [21]/year prior	42.3% of all who had had vaginal or anal intercourse	20.6% of all who had had vaginal or anal intercourse
PEI 1996[22]/year prior	62% of grade 7, 52% grade 9, 42% grade 10, 31% grade 12	26% of grade 7, 24% grade 9, 20% grade 10, 23% grade 12
Other studies		
Sante Quebec 1991[15]	85% used a condom at least once in their life, and 9% had never used a condom	
BC Adolescent Health 1992[16]	percent who used a condom at last sexual intercourse for grades 7 to 12 respectively. For boys: 66, 65, 71, 64, 64, 57. For girls: 64, 69, 63, 56, 47, 45.	
Vancouver Street Youth 1993[26]	64% of boys, 48% of girls used a condom at last sexual intercourse	

Table 7: Percent of Canadian adolescents reporting a history of sexually transmitted diseases, by gender		
Study	Boys	Girls
CYAIDS 1988[13], among those who had ever had sexual intercourse	3% of college/university students, 7% of dropouts ever had STD	5% of college/university students, 12% of dropouts ever had STD
NPHS 1994[18]	0.3% had STD in two years prior	1.6% had STD in two years prior
CHM 1997[23]	0.0% in the five years prior	1.8% in the five years prior
SYAIDS 1988[24], among those who had ever had sexual intercourse	16% ever had STD	30% ever had STD
Ottawa street youth 1993[27]	4.9% ever had STD	15.4% ever had STD
Alberta STD study 1994[29]	11.1% had STD in last 12 months, 22.1% ever had	15.1% had STD in last 12 months, 25.8% ever had

HIV Risk Behaviours among Adults in the Canadian Population

This section deals with general population surveys of adults and with general population surveys from which data for those 20 years of age and over has been extracted. As with adolescents, "adult" has been defined fairly pragmatically. For surveys where we had access to the raw data, adults were defined as those 20 years of age and over (CHM, NPHS). The definition of adult in the three surveys for which we do not have the raw data are 18 years of age and older (AIDS in Canada), 16 to 44 years of age (Ontario Health Survey), and 15 to 64 years of age (Quebec General Population survey). A list of studies reviewed is presented in Table 8, and includes the year in which the study was conducted, a sample description, recruitment methods, and number of subjects.

Sexual Behaviours

Number of sexual partners

Information on number of sexual partners is described in Table 9. Some studies ask this question only of respondents who have ever had sexual intercourse or have had sexual intercourse within the specified time period; other studies ask this for all respondents. The majority of respondents report having one partner in the year prior to being surveyed. The percentages who report having multiple (more than one) partners in the last year ranges from 4% (women in the CHM 1994) to 16% (men in the Quebec study 1996). Comparing data from those surveys which inquire about partner number for a period of one year, it is difficult to say whether or not there has been decline in the proportions reporting multiple partners, but there certainly does not appear to have been an increase.

Anal intercourse

Data on anal intercourse (penis-in-anus) are presented in Table 10. The CHM studies asked about anal intercourse in the year prior whereas the Quebec study asked about anal intercourse during the most recent sexual encounter. The proportion of respondents reporting anal intercourse ranges from 3.2% (women in the CHM 1997) to 6.1% of men in the CHM 1994 who reported anal intercourse with a woman in the prior 12 months. Given that unprotected anal intercourse is considered a high-risk activity[7,8] it is important to know about the frequency of condom use during anal intercourse. Although condom use during anal intercourse between men is discussed in detail elsewhere in this report (see section on risk behaviour among men who have sex with men), few studies inquire about condom use during anal intercourse between men and women. What information is available suggests that many people do not use condoms during anal intercourse (see section below on condom use).

Oral intercourse

Few studies inquire about oral intercourse (penis-in-mouth, or mouth-on-vagina), perhaps because it is considered a low risk for HIV infection. Indeed, only two of the studies discussed here inquire about oral intercourse and these data are presented in Table 11. The CHM 1994 inquired about anal intercourse in the year prior to the survey, and the Quebec study inquired about oral intercourse during the most recent sexual encounter.

Condom use

Information on condom use is presented in Table 12. The NPHS 1994 and the CHM 1994 ask about condom use during the prior year whereas the Quebec survey and the CHM 1997 ask about condom use at last intercourse. From the CHM 1994 and the CHM 1997 it can be seen that reported condom use is higher among those with more than one partner than among those with one partner, and is higher with casual than with regular partners. However, the data suggest that a substantial proportion of acts of sexual intercourse are unprotected and this is cause for concern, especially in cases of those who have multiple partners. For example, in the CHM 1994, among those who had more than one partner in the last year, 17.6% of men and 7% of women who had casual partners reported never using condoms with casual partners in the last 12 months. In the CHM 1997, of those who had two partners in the last year, only 53.9% of men and 50.6% of women used a condom the last time they had intercourse with a casual partner. The CHM 1997 also inquired about condom use at last anal intercourse; of those who reported anal intercourse in the last year, only 16.3% of men and 11% of women reported using a condom the last time they had anal intercourse. This is interesting as it suggests that condom use is lower for anal intercourse than vaginal intercourse and is consistent with the findings of a study conducted in the US[30].

Ideally, information on condom use should distinguish between condom use with regular and casual partners, and condom use for vaginal and anal intercourse. Most studies do distinguish between regular and casual partners, but not all distinguish between vaginal and anal intercourse. It is also difficult to make comparisons across studies and over time given that some studies inquire about condom use at last intercourse whereas others inquire about average condom use over a period of time, such as over the year prior to the study.

Same sex contact

In the CHM 1994, 1.8% of men report ever having sexual intercourse with another man, and 55.5% of these had sexual intercourse with a man in the last 12 months. Among women, 1.1% report ever having had sexual intercourse (oral intercourse) with a woman, and of these, 45.4% report sexual intercourse with a woman in the last year. In the CHM 1996, 2.6% of men reported having sexual intercourse with another man since 1978. In the Quebec General Population

Survey, 7.1% of men reported ever having had sexual relations with another man, and of these, 43% had had penetrative relations. In the CHM 1997, less than one percent of men reported having anal intercourse with a man in the year prior.

The reported level of same-sex contact among the general population appears to be fairly low. Nevertheless, because of the risk of HIV transmission in the case of MSM and because among women, same-sex contact is a marker for HIV-associated risk behaviour, it is important that this behaviour be monitored[31].

Sex-trade activity

The proportion of people in the general population who report engaging in sex-trade activity appears to be quite low. In the CHM 1994, 6.1% of men reported ever having paid for sex with a woman, and 0.6% of all women reported ever having received money or drugs in exchange for sex with either a man or a woman. None of the general population surveys inquired as to whether men received money for sex, or whether women paid for sex.

History of Sexually Transmitted Diseases (STD)

Data on STD are reported in Table 13. The proportion of people reporting having had an STD appears to be fairly low among the general population, ranging from 0.6% of women in the CHM 1994 to 2.1% of men in the CHM 1997.

Injection Drug use

In general population surveys, the proportion of people reporting IDU, particularly recent IDU, is quite low. According to the CHM 1994, 1.9% of men had ever injected drugs, and of these 7.9% of these had injected in the 12 months prior. Among women, 0.9% had ever injected drugs, and 6.8% of these had injected in the 12 months prior. According to the CHM 1997, 1.9% of men and 0.6% of women had ever injected drugs in their lifetime.

HIV testing

Data on HIV testing are reported in Table 14 and suggest that almost one-fifth of Canadians have sought HIV testing. Although there is encouraging evidence that testing is higher among those Canadians who report risk factors[23,32] there is evidence to suggest that among those tested, most were tested over a year ago. Of respondents to the CHM 1997 who had been tested, 39% of men and 34% of women had been tested in the year prior, and 45% of men and 44% of women had

been tested two or more years prior. More needs to be learned about possible behaviour changes after HIV testing.

Discussion

Major observations and conclusions

Despite a lack of regularly conducted surveys among the general population, certain problems are apparent. Many people still do not use condoms consistently. This is of concern, particularly with casual partners. Although the proportions reporting risk factors such as a history of STD, injection drug use, sex between men, and sex-trade activity are relatively low, they translate into a substantial number of people who are at risk for HIV infection. Thus, it is important to continue to monitor the level of these behaviours within the general population.

Limitations of available data

Because relatively few major surveys on risk behaviour have been conducted among the general population and the operationalization of risk behaviour variables differs across surveys, it is difficult to comment on trends. In order to observe changes over time, cross-sectional surveys to assess the level of HIV-risk behaviour should be conducted among the general population on a regular basis using standardized questions.

Specific data needs

Information on condom use is limited. Most surveys ask questions only on condom use in general, or on condom use with regular and casual partners. More specific information is needed on how condom use varies with vaginal and anal intercourse. As well, research needs to be done on how best to measure condom use. For example, it is not clear whether asking about average condom use over a given time period yields more or less valid population estimates of condom use than does asking about condom use at most recent intercourse.

Table 8: Inventory of Canadian general population studies on risk behaviours among adults			
Study and year of data collection	Investigators	Sample description and how recruited	Sample size and gender distribution
AIDS in Canada: Knowledge, behaviours and attitudes of adults, 1988[33]	Ornstein, M.	Canada-wide telephone survey, respondents aged 18 years and older	N = 1,259, gender distribution not provided)
Health Promotion Survey (HPS), 1990[14]	Health and Welfare Canada, Stephens, T., Fowler-Graham, D. (Eds)	aged 15 and older but data presented here only for those 20 years of age and older	N = 12,782, 44.4% men
Ontario Health Survey, 1990[34]	Kasenda, M, Calzavara, L, Johnson, I, LeBlanc, M.	analyses include only those aged 16-44	N=26,121 (gender distribution not provided)
Canada Health Monitor (CHM) 1994[17]	Bureau of HIV/AIDS and STD, Health Canada	Canada-wide telephone survey, 15 years of age and older but data presented here only for those 20 years of age and older	N = 2,339, 44.3% men
National Population Health Survey (NPHS) 1994[18]	Health Canada	longitudinal survey, data presented here only for those 20-44 years of age	N = 7,276, 45% men
CHM 1996[19]	Bureau of HIV/AIDS and STD, Health Canada	Canada-wide telephone survey, aged 15 years and older, data presented here only for those 20 years and older	N = 2,887, 44% men
Quebec General Population, 1996[35]	Adrien A, Dassa C, Leaune V, Perron M.	ra ndom digit dialling telephone survey, aged 15 - 64 years of age	N = 3,501, 42.3% men
CHM 1997[23]	Bureau of HIV/AIDS, Health Canada	Canada-wide telephone survey, aged 15 years and older, data presented here only for those 20 years and older	N =2,318, 44.8% men

Table 9: Distribution of percentages of adults reporting noted number of sexual partners by study type and gender respondent

Study Name/Denominator	Gender	0	1	2	3	4	5	6	7	8	9	10	11+
Lifetime													
Quebec General Population Survey 1996/all respondents[35]	M F	8 7	16 29	26 33			21 17						29 14
Five years prior													
Ornstein 1988/all respondents[33]	M F	6 14	57 73	11 7	13 5			7 1					6 0
Year prior													
Ontario Health Survey 1990[34]/all respondents	all	15	62	10									
HPS 1990[14]/those who have had sexual intercourse in prior year	M F		89 94	5 3	6 3								
CHM 1994[17]/those who have ever had sexual intercourse	M F	14 28	73 68	5 2	8 2								
NPHS 1994[18]/all respondents	M F	9 9	79 84	6 4	6 3								
Quebec General Population Survey 1996[35]/all respondents	M F	9 13	75 79	16 8									
CHM 1997[23]/those who have ever had sexual intercourse[3]	M F	5 11	87 84	4 3	4 2								

Table 10: Percent of Canadian adults reporting anal intercourse, by gender		
Study	Men	Women
in the year prior		
CHM 1994[17]	6.1% with a woman	3.8%
CHM 1997[23]	5.2% (includes male and female partners)	3.2%
at last sexual encounter		
Quebec General Population[35]	6.0%	5.7%

Table 11: Percent of Canadian adults reporting oral intercourse, by gender		
Study	Men	Women
Canada Health Monitor, 1994, in year prior[17]	39.8% received oral sex from a woman, 40.5% had given oral sex to a woman. 0.8% had received from a man, 0.8% had given oral sex to a man	28.4% had received from a man, 28.7% had given to a man. Less than 0.5% had received or given oral sex to another woman
Quebec General Population Study 1996, at last sexual encounter[35]	54.4%	43.0%

Table 12: Percent of Canadian adults reporting condom use, by gender		
Study/time period	Men	Women
NPHS 1994[18] (among those who are married or living with someone and have more than one partner, and those who are single with one or more partners)/in year prior	50% always used, and 27.6% had never used	39.5% always used, and 37.0% never used
CHM 1994[17]/in year prior	Of those with one partner in year prior, 8.9% always used, 68.8% never used. Of those who had more than one partner, 33.4% always used & 35.7% never used with regular partner; 59% always used & 17.6% never used with casual partner.	Of those with one partner in the year prior, 6.8% always used, 70.8% never used. Of those who had more than one partner, 45% always used & 17.7% never used with regular partner; 69.7% always used & 7% never used with casual partner.
Quebec General Population Survey 1996[35]/ last sexual encounter	13.9% with regular live-in partner, 47.7% with regular non-live-in partner, 68.9% with casual partner	11.5% with regular live-in partner, 37.0% with regular non-live-in partner, 69.8% with casual partner
CHM 1997[23]/at last intercourse	Of those with one partner in year prior, 17.3% used for regular partner; 58.3% used for casual partner. For those with two partners, 39.7% used with a regular partner; 53.9% used with a casual partner.	Of those with one partner in year prior, 13% used for regular partner, 39.6% used for casual partner. For those with two partners, 30.6% used for regular partner; 50.6% with a casual partner.

Table 13: Percent of Canadian adults reporting a history of sexually transmitted diseases, by gender		
Study	Men	Women
NPHS 1994[18]	0.8% in two years prior	1.5% in two years prior
CHM 1994[17]	0.7% in 12 months prior	0.6% in 12 months prior
CHM 1997[23]	2.1% in five years prior	1.3% in five years prior

Table 14: Distribution of percent of Canadian adults reporting HIV testing		
Study	Men	Women
CHM 1994[17] (specifically including blood donation)	21.5%	15.2%
NPHS 1994[18] (including blood donation)	24.9%	24.7%
CHM 1996[19] (specifically including blood donation, insurance testing)	42.4%	30.9%
CHM 1997[23] (specifically excluding blood donation)	18%	15.4%

Sexual and Injection Risk Behaviours among Injection Drug Users in Canada

Injection drug users (IDU) are at risk for HIV infection primarily through the sharing of needles and other injection equipment, and also from unsafe sexual practices[36]. This section summarizes available information on HIV risk behaviours among IDU in Canada. Table 15 shows a list of studies reviewed including the names of the principal investigators, number of participants, method of recruitment, and the year of data collection for each study.

Drug Injection Behaviours Among IDU

Injection drug of choice

Data on injection drug of choice are presented in Table 16. Almost all of the studies conducted in Canada indicate that cocaine is the most frequently injected illegal drug, followed by heroin. For example, the majority of respondents (88.3%) in the SurvIDU study had injected cocaine in the six months prior to being surveyed, whereas about one-third (37%) had injected heroin, and in the Vancouver 1996/97 cohort study, 64% reported cocaine as their main injection drug in comparison to 25% who reported heroin. This is of concern as cocaine is associated with a greater frequency of injection than is heroin and has also been associated with riskier sexual and injection practices[37].

Frequency of injection

More frequent injection has been associated with higher HIV prevalence[38]. In the St. Luc cohort study (1988-1995), 25.8% of respondents injected more than a 100 times in the month prior. In the SurvIDU study (1994-1997), 66% of respondents reported injecting once a week or more. In a case-control study in Vancouver (1995), 40% of men and 66.3% of women reported injecting drugs more than four times a day, and 31.4% of men and 51.7% of women injected cocaine more than four times a day. Among Montreal street youth (1995-1996), 20.6% injected every day. According to an analysis of cross-sectional data collected in the Montreal NEP study (1995-1997), in year one, 39.8% of respondents injected every day in the month prior to the interview, and in year two, 40.3% injected every day. Among NEP attenders in Quebec city (1996), 13.4% injected once a day or more in the month prior to the study.

Sharing of needles and other injection equipment

Results for sharing, lending, and borrowing of needles are reported in Table 17 and indicate that a large proportion of IDU share (borrow and/or lend) needles. From studies presented, it appears that at least 30% of respondents have borrowed needles, and at least 29% lend. The percentage of respondents who reported borrowing needles ranges from 30% of women in the Ottawa study

(1997) in the six months prior, to 75% in the St. Luc cohort who reported borrowing in the six months prior to the study. The percentage of those who report lending needles varies from 29% of men in the Ottawa study to 42.4% of those in the Toronto study (1991). In the analysis of the cross-sectional data from the Montreal NEP study 1995-1997 (not shown in table), in year one, 45.6% of respondents always practised safe shooting (defined as using a sterile needle every time, or cleaning with bleach if did share), compared to 46.4% of those who responded in year two (difference not significant). When comparing data for the 81 participants who were surveyed in Year 1 and Year 2, however, a significant increase in safe shooting was observed with 38.2% reporting safe shooting in Year 1 compared to 53.1% in Year 2. Although there was no difference between Year 1 and Year 2 in the percentage reporting borrowing (44.4% vs. 39.5%, see Table 17), there was a significant decrease in the percentages reporting lending (54.3% vs. 35.8%, see Table 17)[39] .

A study at the Quebec Detention Centre in 1994 (not shown in table) found that among women who had used injection drugs before being incarcerated, 58% had shared (borrowing and lending not specified) needles. Although only five of these women (11% of those who had used before prison) used injection drugs while in prison, four of the five had shared needles while in prison. Among men who had used injection drugs before being incarcerated, 49% had shared. Twelve of these men (9.3% of those who had used before prison) used injection drugs while in prison, and 11 had shared needles[40].

Among those who share (borrow or lend) needles, most report being more likely to share with close friends or partners than with strangers. Among street youth and school dropouts across Canada (1988)[13], most sharing occurred between boyfriend/girlfriends or close friends. When asked their main source of needles for sharing, 30.7% of respondents in the SurvIDU (1994-1997) study reported sharing with a friend or regular partner, 8.4% shared with strangers, and 60.9% did not share[41]. In the Vancouver study conducted in 1995, of those who shared, 49% borrowed most often from acquaintances or casual friends, 25% borrowed from close friends, and 22% borrowed from regular partners, and 41% of women and 13% of men borrowed from a regular partner[42]. In the Ottawa study (1996-1997), among those who borrowed, 16% of men and 57% of women had obtained used needles from their steady sexual partners and 56% of men and 39% of women had obtained used needles from close friends or family[43]. In a Quebec City NEP (1996), among those who shared needles in the six months prior, 61.7% shared only with sexual partners or friends and the remaining 38.3% had shared with strangers[44].

Several studies indicate that a number of IDU either borrow needles from someone who they know to be HIV-positive and that some HIV-positive IDUs lend needles. However, it is not always clear whether the borrowers/lenders were aware of their own or the other person's serostatus when these behaviours occurred, or if they only became aware of this later. Among those in the St. Luc cohort, 10.6% of all respondents had borrowed from an HIV-positive person and about half of these knew at the time that the person was HIV positive[45]. Among female prison inmates in Quebec (1994), 44% of HIV-positive and 9.7% of HIV-negative participants (14% of total sample) had borrowed or lent needles with an HIV positive person. 76.2% of those

who were HIV positive had shared needles with a stranger[46]. In a study of Montreal street youth (1995-1996), 2% of the regular users had purposely injected the blood of an HIV-positive person (respondents were not asked why)[47]. In a Quebec City NEP (1996), 11.1% of respondents (26.6% of those who had borrowed) had ever borrowed a needle from someone who was HIV-positive[44]. In a study conducted at an Ottawa NEP (1996-1997), 19.2% of respondents were HIV-positive and of these, 8% reported lending needles[43].

Cleaning borrowed needles with bleach may reduce the risk of HIV transmission (see discussion in Normand, Vlahov & Moses)[48]. In the Toronto study (1991-1994), among those who borrowed needles, 59.5% always cleaned and 8% never did, and of those who ever cleaned borrowed needles, only 51% used bleach[49]. In the Alberta Sexually Transmitted Disease (STD) study (1994), of those who shared needles, 46.6% said they had cleaned needles with bleach in the prior 12 months[29]. In the Vancouver study (1996-1997), of those who borrowed needles in the six months prior, 22.6% consistently cleaned these needles with bleach[50]. In a third study, conducted with a small group of Ontario prison inmates, it was found that among seven inmates who had shared injection needles, three of the seven had not cleaned the needles properly[51].

As well as the sharing of needles, many studies report also on the sharing of equipment other than needles such as cleaning fluid, cottons, or spoons. In the SurvIDU study (1994-1997), it was found that 45.9% of respondents shared other equipment[41]. In the Vancouver case-control study (1995), 69% of participants reported sharing other equipment and this was higher among those who borrowed needles (83%) than among those who did not (53%)[42]. Of a small group of new injectors among street youth in Montreal (1995-1996), 26.3% had borrowed cottons, 52.6% had borrowed cleaning water or fluid, and 57.9% had borrowed a spoon[47]. Among NEP attenders in Ottawa (1996-1997), 52% of male respondents and 33% of female respondents shared injection equipment other than needles[43]. In a cohort study in Vancouver, 45% of IDU reporting sharing of other injection equipment[50].

Sharing of needles and other equipment is fairly common and is a serious problem. There does not appear to have been any decrease in needle sharing, but as the majority of studies have been done fairly recently, it is difficult to assess trends from sharing behaviour given the lack of comparable data over time.

Sexual behaviour of IDU

Number of sexual partners

Information from various studies on number of sexual partners is reported in Table 18. From these results, it appears that the majority of respondents had more than one sexual partner within the last year. For example, in the SurvIDU study (1994-1997), 51% of men and 76% of women had two or more partners in the six months prior, and in the Alberta STD study, 14.6% of men and 26.8% of women had six or more partners in the year prior.

Because some studies inquire about number of partners for the last six months, and others for the last year, it is difficult to make comparisons across studies and over time. It would be useful if the type of partner was specified rather than just having the total number of partners within a given time period. As well, more information is needed on what percentage of respondents have had a sexual partner within the specified time period. Despite these gaps, however, it is clear that IDU, in particular female IDUs, have a higher number of sexual partners than do people in the general population. For example, in a Canada-wide general population survey, 8.7% of men and 7.0% of women had two or more partners in the prior year (Canada Health Monitor, 1997)[23], compared to the range observed among IDU (10.6% of men in the Quebec city NEP study and 76% of women in the SurvIDU study had two or more partners in the six months prior). Differences in the proportions having multiple partners may be partly due to the greater likelihood of IDU being involved in sex-trade activity (see next section).

Type of sexual partners

Percentages of respondents having regular and casual partners are reported in Table 19. It appears that, from the majority of studies, less than half of male IDUs report having a regular partner. For example, 48.5% of men in the SurvIDU study (1994-1997) indicate that they had a regular female partner in the six months prior to the survey, and in the Vancouver case-control study (1995), 37.9% of men report having had a regular partner. In comparison, in the CHM 1997, a general population survey, 72.6% of men reported having one or more regular partners within the prior year[23]. The percentage of female IDU who report having a regular partner is generally larger than that among male IDU (e.g., 88.1% compared to 84.2% in the Alberta STD study, and 69.2% compared to 48.5% in the SurvIDU study). With respect to casual partners, the proportion of IDU who report having had a casual partner seems higher than that in the general population. For example, in IDU studies, percentages reporting casual partners range from 18.4% (Toronto, 1991) to over 80% (Alberta STD study), compared to 8.1% of men and 5.3% of women in the CHM 1997[23].

The percentages of IDU reporting sex-trade partners is presented in Table 20. A substantial proportion of IDUs, especially women, have had sex-trade partners. For example, in the Toronto study, 44.3% of women report having had an opposite sex client in the six months prior, and in the Vancouver 1995 study, 61.8% of women reported having exchanged sex for money or drugs in the six months prior. Among men, percentages reporting sex trade range from 2.3% in the Quebec City NEP study, to 8.3% in the Alberta STD study.

Same-sex partners

The percentages of IDU reporting same-sex partners is presented in Table 21 and these data suggest that same-sex contact is higher among IDU than among the general population. For example in the CHM 1994, 1.9% of men and 1.3% of women reported ever having sex with

someone of the same sex[17], and in the 1996 CHM, 2.6% of men reported ever having sex with a man since 1978[19]. In comparison, among IDU, the percentages reporting same-sex partners ranges from 4.4% of men in the SurvIDU study who had a regular male partner in the six months prior to 25.5% of women in the Alberta STD study who report having had a female partner in the year prior. As well, in the St. Luc cohort, 9.2% of respondents reported having either a homosexual or bisexual orientation, however, information on actual same-sex behaviour was not presented[45]. For men, this relatively high rate of same-sex contact may be related to sex-trade activity to obtain money for drugs.

Condom use with regular and casual partners

Data on condom use with regular and casual partners are presented in Table 19. As in the general population, condom use is less frequent with regular partners than with casual partners. For example, in the SurvIDU study (1994-1997), 45.1% of women with casual partners reported always using condoms compared to 20.7% of women with regular partners. The low rate of condom use between regular partners is cause for concern. For example, in the SurvIDU study, 58.8% of men and 50.3% of women report never using condoms with regular partners during the six months prior. This is alarming, especially in the case of female IDUs who are more likely than are male IDU to have a regular sexual partner who is also an injection drug user[52].

Condom use with sex-trade partners

Results for studies that reported condom use with client partners are presented in Table 20. Although condom use is more likely with client partners than with either regular or casual partners, a substantial proportion of those involved in the sex trade report inconsistent condom use. Among women, most studies suggest that at least two-thirds always use condoms with sex-trade partners. For men, condom use is not always reported separately for same-sex and opposite-sex clients, thus, making it difficult to comment on overall levels or trends of condom use. In the SurvIDU study, among men with male clients, 36.1% always use condoms and among men with female clients, 49.1% always use. In the Toronto study (1991), among men with female clients, 33.3% reported always-use. These data suggest that men are less likely to use condoms than are women with sex-trade partners. Given that sex-trade activity appears rather common, especially among women IDUs, the proportions reporting always-use of condoms are low.

Does sexual behaviour vary according to type of drug used?

There is some evidence that cocaine use, more so than heroin, is especially associated with risky sexual behaviour[37]. However, only the Toronto study has presented this information and it suggests that cocaine users have more partners although they are no less likely (and may be more

likely) to use condoms than are heroin users[53]. In this study, those who had used only cocaine and not heroin in the last six months were compared to those who had used only cocaine or crack but not heroin in the last six months. It was found that male cocaine users were significantly more likely to use condoms with regular partners than were heroin users (percentages not reported) and more likely to use condoms with casual partners than were heroin users (75% of male cocaine users and 61% of male heroin users always/sometimes used condoms with casual partners). Among women, condom use for regular partners, casual partners, and client partners, did not differ significantly between heroin and cocaine users. Thirty-seven percent of cocaine users and 29% of heroin users always/sometimes used condoms with regular partners; 48% of cocaine users and 25% of heroin users always/sometimes used condoms with casual partners, and 86% of cocaine users and 100% of heroin users used condoms always/sometimes with client partners. Among men, heroin and cocaine users did not differ in number of regular sexual partners in the last six months (means not provided). Cocaine users had a higher median number of casual partners than did heroin users (2.49 vs 1.14). Among women, cocaine and heroin users did not differ in number of regular partners (means not provided). Cocaine users had a higher number of casual partners (mean of 1.13) than did heroin users (mean of zero). As well, cocaine users had more client partners (mean of 9.58) than did heroin users (mean of 3.55).

More information is needed on differing levels of risk behaviour among those who use primarily cocaine and those who use primarily heroin.

HIV testing among IDU

According to the Canada Health Monitor, a large proportion of IDU (62% - 64%) had been tested for HIV as of January 1996[32], and 63% of respondents in the Quebec City NEP study (1996)[44] had been tested. As well, 61.4% of IDU in the Alberta STD study (1994) had been tested[29]. These findings and those from other studies, such as the Vancouver studies where participants are tested as part of the study, suggest that a majority of IDU have been tested; however, there is evidence to suggest that, in many cases, testing may not be recent. In the Alberta STD study, of those tested, 45.7% had been tested within the year prior and 25.7% had been tested two or more years prior to the survey, and in the CHM 1996[32], 31% had been tested within the year prior, and 50% had been tested more than two years prior to the survey. Furthermore, the link between knowledge of serostatus and behaviour is not clear. Results mentioned earlier suggest that some people who know themselves to be HIV positive continue to borrow and/or lend needles. Findings such as this emphasize the importance of learning more about the relation between testing and subsequent risk behaviours.

Discussion

Major observations and conclusions

The level of risk behaviours among IDUs surveyed in Canada is unacceptably high. A large proportion of IDU borrow or lend injection needles, many do not clean borrowed needles properly, and many share equipment other than needles. Most studies show a 30-50% rate of needle borrowing in the six months prior. This is very high, especially compared to countries such as Switzerland where the comparable rate is around 10%. Especially alarming is the lending of needles by those who know themselves to be HIV positive. Many IDU, especially women, engage in sex-trade activity, and among IDU who are sexually active, many fail to use condoms consistently, both with their IDU, and their non-IDU partners. The level of same-sex contact among IDU is higher than that in the general population and this is an added HIV-risk for this group.

Limitations of available data

Two important limitations of the available data on risk behaviours among IDU should be mentioned. First, because it is very difficult to obtain random samples of IDU, it is important to note that samples used in the studies described here may not be representative of the IDU population. Most studies described here have relied on samples recruited from needle exchange or street outreach. More needs to be learned about IDU, such as those in rural areas, who may be missed in these studies. The second limitation is the difficulty assessing trends in levels of risk behaviour. Although two major cohort studies are in place, data on trends are not yet available. It is expected, however, that some data on this will be available within the next year.

Specific data needs

Information is lacking in certain areas. First, more needs to be learned about differences in sexual and drug-using behaviours between those who primarily use cocaine and those who primarily use heroin. Second, many IDU, especially women, are involved in the sex-trade and more information is needed on numbers of sexual partners specified by partner type. Finally, regular standardized data collection is needed to assess trends in unsafe behaviours among IDU.

Table 15: Inventory of studies of Canadian IDU			
Study and year of data collection	Investigators	Sample description and how recruited	Sample size and gender distribution
SYAIDS, 1988[24,54]	Radford J, King A, & Warren W	Canada-wide, street youth, dropouts	N = 712 street youth, (391 men)
Toronto study, 1991[49,55]	Myers T et al.	IDU in AIDS prevention program	N = 582 (500 men)
Toronto study, 1991-1994[53]	Millson M, Myers T et al.	IDU in AIDS prevention program	N = 1305 (1045 men)
Quebec female prison, 1994[42]	Hankins C et al.	prison	394 female prisoners
Quebec prison, 1994[40]	DuFour A et al	prison	N = 618 inmates (499 men)
Alberta STD study, 1994[29]	Romanowski B et al.	STD clinic attenders (classified as IDU if injected in last 12 months)	N = 6668, 140 (97 men) had injected at least once in the last year
St. Luc cohort, Montreal 1988-1995[45]	Bruneau J et al.	IDU, word-of-mouth on street, treatment centres	N = 1599, 79.7% men
Ontario prison, 1995[51]	Calzavara L et al.	Focus group in prison	N =39 (20 men)
Vancouver, 1995[42,56,57] (case-control study)	Strathdee S, Patrick DM, Ofner M, Archibald CP et al.	street outreach, testing sites, health care providers (injected in last month), included HIV positive and HIV negative subjects	N = 281 (185 men)
Montreal street youth, 1995-1996[47]	Roy E et al.	street youth	N = 121 IDU (72 men)
Quebec City NEP, 1996[44]	Poulin C, Alary M, Noel L et al.	NEP attenders - injected in last six months	N = 817 (601 men)
SurvIDU 1994-1997[41]	Alary M, Hankins C, Parent R et al.	NEP attenders in 7 sites in Quebec, Ottawa - injected in last six months	N = 3015 (2189 men)
Montreal NEP, 1995-1997[39]	Hankins C et al.	NEP attenders - injected in last six months	N = 399 Year 1, N = 563 Year 2
Ottawa NEP, 1996-1997[43]	Leonard L et al	NEP attenders - injected in last six months	N = 250 (170 men)
Vancouver cohort study, 1996-1997[50]	Strathdee S, Patrick D et al.	self-referral, street outreach, injected in last month	N = 1006 (653 men)

Table 16: Injection drug of choice among Canadian IDU			
Study/Time period	Cocaine	Heroin	Other
Toronto, 1991[55]/prior six months	95.4% used	38.3% used	
Alberta STD study 1994[29]/year prior	77.1% used	16.4%	
SurvIDU 1994-1997[41]/ six months prior	88.3% had used, 74% said was their main injection drug	37% had used, 20% said was their main injection drug	26% phencyclidine (PCP)
Vancouver, 1995[56]/ about six months prior	90.3% of men, 88.8% of women	69.7% of men, 72.9% of women	
Montreal street youth 1995-1996[47]/six months prior	40.2% said most frequently injected drug, 68.4% among new injectors	57.8% said most frequently injected drug, 26.3% among new injectors	among new injectors, 5.3% said PCP was most frequently injected drug
Quebec City NEP 1996[44]/six months prior	93.3% had injected	20.6% had injected	13.1% had injected PCP
Ottawa NEP 1996-1997[43]/six months prior	79% of men, 89% of women said was their main injection drug		
Vancouver cohort 1996-1997[50]/six months prior	64% said was their main injection drug	25% said was their main injection drug	11% said "speedball" (heroin and cocaine injected together) was main injection drug

Table 17: Percentage of Canadian IDU reporting borrowing, lending, and sharing (borrowing and lending combined) of needles			
Study	Borrowing	Lending	Borrowing and/or Lending
SYAIDS 1988[54]			half of street youth and one-third of dropouts[a]
St. Luc cohort 1988-1995[45] (six months prior)	75%		
Myers (1991)[55] Toronto (six months prior)	45.7%	42.4%	57%
Alberta STD (1994)[29] (in last 12 months)			41.4%
Vancouver (1995)[56] test retest interval	55%		
Montreal street youth (1995-96)[47]	57.9% (11) of new injectors	42.1% (8) of new injectors	54.5% shared at Time 2
Quebec city NEP (1996)[44]/ six months prior			42%
Survidu (1994-1997)[41] (six months prior)	44%	37.5%	
Montreal NEP (1995-1997)[39] six months prior	cross-sectional analysis: 39.8% in year 1, 43.9% in year 2[b] repeated measures: 44.4% vs 39.5%	cross-sectional analysis: 40.4% in Year 1, 40.3% in Year 2 repeated measures: 54.3% vs 35.8%	
Ottawa (1996-97)[43] in six months prior	33% of men and 30% of women	29% of men, 32% of women	52% of men, 33% of women shared other equipment
Vancouver cohort, 1996-1997[50]	68% ever, 39.7% within last six months	37.9%	

[a] Exact percentages not provided

[b] The cross-sectional analysis compared 399 IDU in year 1 with 563 IDU in year 2. The repeated measures analysis was conducted on 81 IDU who participated in year 1 and year 2 of the study.

Table 18: Number of sexual partners among Canadian IDU		
Study	Type of partner/time period	Percent of sample reporting multiple partners
Alberta STD study (1994)[29]	not specified/12 months prior to study	Among those who had sex in the 12 months prior, 14.6% of men, and 26.8% of women had six or more partners (16.7% of men and 14.6% of women did not know how many partners they had)[a]
Quebec City NEP (1996)[44]	opposite-sex/six months prior	22.6% of men had six or more 48% of women had six or more
	same-sex/six months prior	10.6% of men had two or more 12% of women had two or more
SurvIDU (1994-1997)[41]	not specified/six months prior	51% of men had two or more partners, 76% of women had two or more, 48% of women had six or more
Ottawa NEP (1996-1997)[43]	not specified/six months prior to study	2% of men and 60% of women had more than 20 partners

[a] These percentages are of the total sample of IDU

Table 19: Frequency of Canadian IDU reporting regular and casual sexual partners and condom use with this partner type			
Study	Type of partner	% of sample who have this type of partner	Condom use with this partner type
Toronto 1991[55]	Regular	24%	43.1% ever use
	Casual	18.4%	30.8% always use
Alberta STD study 1994[29]	regular partner	84.2% of men	17.5% always, 42.5% never
		88.1% of women	13.5% always, 43.2% never
	casual partner	85.3% of men 88.1% of women	28.4% always; 22.2% never 35.1% always; 21.6% never
Vancouver 1995[56]	regular female	37.9% of men	% not provided
	regular male	54.9% of women	% not provided
	casual female	36.2% of men	50.7% use condoms > 75% of time
	casual male	22.5% of women	60% use condoms > 75% of the time
SurvIDU 1994-1997[41]	Regular male	4.4% of men	27.5% always, 58.8% never
	Regular female	48.5% of men	26.4% always, 50.3% never
	Casual male	6.8% of men	25% always, 48.8% never
	Casual female	48.4% of men	43.3% always, 27.7% never
	regular male partner	69.2% of women	20.7% always, 50.9% never
	casual male partner	50.9% of women	45.1% always, 24.7% never
Quebec City NEP 1996[44] in six months prior	Regular partner	50.1% of men 72.7% of women	22.3% always 19.1% always
	Casual	60.2% of men 53.7% of women	32.6% always 23.3% always
Montreal 1995-1997 [39]	regular partner	not presented	in year one cohort, 32.3% always used; in year two cohort, 29.3% always used (in the six months prior)
Ottawa NEP 1996-1997[43] (in prior six months)	Regular - opposite sex	not indicated	Never use: men 49%, women 52%
	Casual - opposite sex		Never use: men 30%, women 11%
	Regular - same sex		Never use: men 38%, women 50%[a]
	Casual - same sex		Never use: men 44%, women 73%

[a] For women with same-sex partners, percentages refer to dental dam use.

Table 20: Percent of Canadian IDU reporting sex-trade partners and condom use with these partners			
Study / Time	Gender of Partner (if specified)	% of sample who have this type of partner	Condom Use
St. Luc cohort, Montreal 1988-1995/ever[45]	opposite-sex client	22.6% ever had	
Toronto, 1991[49]/ six months prior	opposite-sex client same-sex client	7.8% of men 44.3% of women 6.6% of men	33.3% always, 51.3% never 67.7% always, 9.7% never 60.6% always, 15.2% never
Alberta STD study 1994[29]/ year prior		8.3% of men 42.9% of women	57.1% always 14.3% never 83.3% always 0% never
Vancouver 1995/approx six months prior[56]	male clients	61.8% of women exchanged sex for money or drugs	
Montreal street youth 1995-1996[47]		21.9% report ever being paid for sex	
Quebec City NEP, 1996[44]/ six months prior		2.3% of men 40.7% of women	57.1% always 65.9% always
SurvIDU 1994-1997[2] /six months prior[41]	male client female client male client	7.1% of men 4.9% of men 40% of women	36.1% always, 38.6% never 49.1% always, 29.8% never 64.5% always, 8.3% never
Vancouver cohort, 1996-1997/six months prior[50]		23% had been paid for sex	
Ottawa NEP, 1996-1997[43]/ six months prior	opposite-sex client same-sex client		Never use: men 29%, women 4% Never use: men 18%, women 67%

Table 21: Percent of Canadian IDU reporting same-sex partners, by gender		
Study/Time period	Males	Females
Alberta STD study 1994[29]/year prior	11.7% (of these, 36.4% had female partners also)	25.5% (of these 72.7% had male partners also)
SurvIDU 1994-1997[4]/six months prior	4.4% had regular, 6.8% casual, 7.1% client	11.1% had regular, 17.2% casual, 2.6% had client
Vancouver, 1995[57]/test-retest interval (about six months prior)	11.9%	12.1%
Vancouver cohort 1996-1997[50]/ six months prior	22.2%	not presented

HIV Risk behaviours among Canadian men who have sex with men (MSM)

The purpose of this section is to review existing data on the trends of HIV-associated risk behaviour among MSM in Canada and to identify areas where relevant data are lacking. Studies included in this synthesis are listed in Table 22 which includes information on recruitment methods, sample sizes, and the year in which each study was conducted. The majority of studies described deal specifically with MSM, although data for MSM also have been obtained from the Alberta Sexually Transmitted Disease (STD) study, and some data are included from the Canada Health Monitor (CHM) telephone-survey of the general population across Canada.

Sexual Behaviours

Number of sexual partners

Among respondents to the Toronto 1984/85 study, in which men were recruited on the basis of having had an HIV positive partner, 21.5% reported having had one to nine partners (in addition to the primary partner), 25.2% had ten to 25 partners, 15% had 26 to 50 partners, and 38.2% had more than 50 partners in the year prior to the study[58]. Of 361 subjects in the VLAS who completed follow-up in 1984-1985 and 1986-1987, the median number of partners in the year before each follow-up was eight, and five, respectively, indicating a significant decline in the number of sexual partners[59]. Of subjects in the Vanguard study who had completed baseline questionnaires as of August 1997, in the year prior to the study, the median number of regular partners was two (with an interquartile range of one to three) and the median number of casual partners was five (with an interquartile range of three to 14)[60]. Data presented in Table 23 indicate that a large proportion, at least one-third, of MSM had more than five sexual partners in the year prior to the given study. Overall, there appears to have been a decline in that 76% of those in the VLAS study had more than five partners in the year prior to enrollment compared to a range of 34.6% (Alberta STD study) and to 56% (Vanguard) in later studies. Considering only data from studies conducted between 1991 and 1997, however, there does not appear to be any decline in number of sexual partners, with at least one-third of respondents reporting more than five partners in the year prior to the study.

Anal Intercourse

Data on anal intercourse (penis-in-anus) are presented in Table 24. Where available, data are reported separately for receptive (penis-in-respondent's-anus) and insertive (respondent's- penis-in-partner's anus) anal intercourse, and for protected and unprotected anal intercourse. There is little consistency in how data are reported across studies. For example, some distinguish between receptive and insertive anal intercourse, others do not; some report condom use on a scale of never to always, whereas others indicate the proportion who report at least one incident

of unprotected intercourse within a given time period; and some studies report condom use for regular and casual partners, whereas others do not specify partner type. Because of these inconsistencies, it is difficult to make comparisons or assess trends over time.

Considering those studies that report data for anal intercourse without specifying receptive anal intercourse (RAI) or insertive anal intercourse (IAI), or protected/unprotected, in the Men's survey (1991), it was found that 61.8% of respondents reported having anal intercourse at least once in the three months prior to the study. In the Alberta STD study (1994), 66% of MSM respondents reported having had anal intercourse in the year prior. No other studies provide comparable data, therefore it is not possible to comment on trends for this activity.

Considering RAI without specifying whether protected or unprotected, in a sample of VLAS participants that included only those who were aged 18-30 at enrollment (1982-1984), 93% report RAI in the year before baseline (enrollment). Among respondents of all ages in VLAS, a comparison of data for 1984/85 with data from 1986/87 suggests a decrease in the proportion engaging in RAI. In VLAS (1984/85), 76% of respondents reported engaging in RAI, and in 1986/87, of those with a regular partner, 58.2% had RAI with a regular partner, and of those with a casual partner, 39% had RAI with a casual partner. Forty-seven percent in the Alberta STD study (1994) and 86% in the Vanguard study (1995) reported RAI. In these studies, the proportions reporting RAI varies rather widely and no clear trend emerges. In most studies, it appears as though the majority of respondents do engage in RAI.

Condoms are more likely to be used with casual partners than with regular partners. In VLAS (1982-1984), in a sample that did not include those who seroconverted, 45% of those with a regular partner had at least one episode of unprotected RAI, and of those with a casual partner, 8% had at least one episode of unprotected RAI. In VLAS (1986/1987), of those with a regular partner, 36.8% said they never used condoms, and of those with a casual partner, 7.1% never used condoms. Similar results are reported for RAI in the Vanguard studies (1995,1997). For IAI, condoms are also more likely to be used with casual partners than regular partners. For example, in VLAS (1982-1984), of those with regular partners, 44% had at least one episode of unprotected IAI with a regular partner compared to 26% of those with a casual partner. Again, similar results are observed in the Vanguard studies.

Proportions reporting unprotected RAI are rather high and given that unprotected RAI is considered one of the most high-risk activities for HIV, this is quite worrisome. In VLAS 1982-1984, among those with a regular partner, 45% had at least one episode of unprotected RAI (27.5% of total sample), and among those with a casual partner, 8% had at least one episode of unprotected RAI (6% of total sample). On a positive note, the VLAS results do suggest an increase in condom use. In 1984/1985, of those who had RAI, 76.5% never used condoms, but in VLAS (1986/87), of those with a regular partner, 36.8% never used condoms with their regular partner, and of those with a casual partner, 7.1% never used condoms with a casual partner. In the Men's Survey (1991), 11.5% of respondents reported never using condoms for RAI, and 14.5% of the sample reported at least one incident of RAI without a condom. In

Vanguard 1995, of those with a regular partner, 38% reported at least one incident of unprotected RAI with a regular partner, and of those with a casual partner, 17% reported at least one incident of unprotected RAI with a casual partner. In a comparison of baseline and follow-up data in the Vanguard study as of April 1997, 29% and 34%, respectively, reported at least one incident of unprotected RAI and 12% and 11%, respectively, reported at least one incident of unprotected RAI with a casual partner.

As previously mentioned, it is difficult to comment on trends. The results of VLAS suggest a decrease in unprotected RAI between 1984/85 and 1986/87, but evidence from the 285 respondents who completed baseline and follow-up in the Vanguard study as of 1997 suggests an increase in unprotected RAI and IAI. As seen in Table 24, at baseline, 30.0% of respondents reported unprotected IAI with regular partners, compared with 40.4% at follow-up. Similar increases are seen for unprotected RAI with regular partners, and for IAI and RAI with casual partners.

In addition to knowing the proportion of those engaging in unprotected anal intercourse, an understanding of what factors are associated with engaging in unprotected anal intercourse is important for planning prevention programs. In the Men's survey (1991), it was reported that unprotected anal intercourse was higher among those under 21 years of age and higher among MSM who had previous heterosexual sex (27.9%), than among currently bisexual men (22.8%) or MSM men who had never had heterosexual contact (20.9%). The Vanguard study (1997) has also examined the association of factors such as depression with risk behaviour and found that risk taking behaviour (having had at least one episode of unprotected anal intercourse with a casual partner or with someone with whom they knew at the time to be HIV positive) was associated with depression [61].

Oral intercourse

In comparison to anal intercourse, fewer studies have examined data on oral intercourse (penis-in-mouth). This is not surprising, given that oral intercourse is much less risky than anal intercourse[62].

Percentages of those engaging in oral intercourse are reported in Table 25. Two studies differentiate between oral intercourse with and without ejaculation, the others do not, thus, making comparison between studies rather difficult. Nevertheless, it does appear that substantive proportions of MSM continue to engage in unprotected oral intercourse. For example, in the Vanguard study (1996), of those with casual partners, 95% of respondents reported having unprotected receptive oral intercourse with casual partners (not noted whether with or without ejaculation) in the year prior to baseline. It does not appear that there has been any decline in the proportion of respondents reporting unprotected oral intercourse. For example, in VLAS (1986/1987), of those with a regular partner, 95% report unprotected receptive oral intercourse (58% of total sample) and 94% of those with a casual partner had unprotected oral intercourse

with a casual partner (70% of total sample) in the year prior to follow-up, and in the Vanguard study (1997), 74% of the sample report unprotected oral intercourse with a regular partner, and 80% report unprotected oral intercourse with a casual partner in the year prior to enrollment.

Type of sexual partners

In the VLAS and Vanguard studies, a regular partner is defined as someone with whom the respondent has sex with on a regular basis and a casual partner is defined as someone with whom the respondent has sex with less than once a month. In VLAS (1982-1984), 61% had a regular partner (or partners), and 74% had a casual partner in the year prior to baseline[55]. In VLAS 1986/1987, 56.1% had a regular partner and 80.2% had a casual partner in the six months prior to follow-up[59]. Of those in the Vanguard study who had completed baseline as of August 1997, 74% had a regular partner and 79% had a casual partner in the year prior to baseline[60].

In the Alberta STD study (1994), a regular partner was someone with whom the respondent had sex with on a regular basis, and a casual partner was someone with whom the respondent did not have sex with on a regular basis. Of MSM (excluding those with female partners) in the Alberta study (1994), 81% had a regular partner and 77% had a casual partner[29].

There does not appear to have been any change in the proportions reporting regular or casual partners. A larger proportion of MSM report having casual partners than regular partners and the data on the proportions of MSM reporting regular and casual partners indicate that many MSM have both regular and casual partners.

Sex-trade activity

Of MSM in the Alberta STD study, 5.8% had received money for sex in the year prior, and of these, 64.3% always used condoms, and 7.1% never used condoms. A total of 2.8% of MSM exchanged sex for drugs and of these, 54.5% always used condoms and 45.5% sometimes used condoms. Four percent had worked in prostitution in the year prior, and of these, 61.1% always used condoms when working, 33.3% sometimes did, and 5.6% never did[29]. Of the subjects who had completed baseline questionnaires in the Vanguard study as of November 1996, 22.8% reported ever having been paid for sex, and 9.2% report ever having paid for sex[63]. Among those who completed baseline and follow-up in the Vanguard study as of April 1997, 18% report having ever been paid for sex in their lifetime, and 8% reported having been paid for sex in the year prior to baseline[64].

There is insufficient data available to comment on trends in sex-trade activity among MSM. From these three studies, it appears that the exchange of sex for money is higher among MSM than in the general population although it is difficult to say as general population surveys tend to ask men only if they have paid for sex and not whether they have received money for sex. For

example, in the CHM 1994, 6.1% of males report ever having paid for sex and less than one percent of females had ever received money for sex[17]. Males were not asked if they had received money for sex. With respect to condom use during sex-trade activity, only one of the three studies provides data on condom use with sex-trade partners, and none of the three provide data on the number of partners among those who engage in sex-trade activity.

Bisexual behaviour

In the Men's Survey (1991), 13.3% of respondents reported having had one or more female partners in the year prior to the study, (7.6% of sample had one partner, 3.5% had two to five partners, and 2.2% had six or more female partners)[65]. Among MSM in the Alberta study (1994), 23.6% of respondents reported having had a female sexual partner in the year prior[29]. Among subjects in the Vanguard study for whom baseline questionnaires had been analysed as of August 1997, 13% reported having had female partners in the year prior to the study[60]. An Ontario survey of bisexual men (1997) found that a substantial number of bisexual men reported unprotected sex in the year prior to being interviewed. Among the respondents to this survey, 75.7% reported having a regular female partner and of these, 67.2% reported at least one incident of unprotected intercourse; 40.4% had a casual female partner and of these, 21.7% had unprotected sex; 58.5% had a regular male partner and of these, 21.7% reported at least one incident of unprotected sex, and 61.3% had a casual male partner, and of these, 12.4% reported at least one incident of unprotected sex[66].

Although the proportion of participants reporting sex with women varies from study to study, it appears it is rather high. Given the prevalence of HIV among MSM, bisexual behaviour has serious implications for the risk of HIV infection among females and for prevention strategies. Evidence from a recent qualitative study suggests that some MSM perceive women as being "safer" partners, thus, they fail to use condoms consistently when with a female partner (Adam, Sears, & Schellenberg, 1997)[67]. More needs to be learned about the frequency of condom use among MSM with female partners.

Sexual encounters in public venues

Having sexual encounters in public places has been associated with risky sexual behaviour such as unprotected anal intercourse[68-70]. In the VLAS study, at baseline (1982-1984), 67% of respondents reported having sexual encounters in bathhouses and 54% reported having sexual encounters in public parks/washrooms[71]. Of subjects who had completed baseline questionnaires in the Vanguard study as of the end of 1995, 40% reported having had sexual encounters in bathhouses, and 40% in public parks or public washrooms in the year prior to the study[71]. Further baseline data from the Vanguard study as of 1998 (N=681) indicated that in the year prior, 38.8% had sex at a sex club, 35.3% in a park, and 24.1% had sex in other public places. Of those who had completed follow-up (N=381), 43.9% had sex in a sex club, 32.1% in a park, and

16.1% in other public places[72]. These results suggest a slight decline of sex in parks, a greater decline in sex in other public places, but an increase in sex in clubs. Together, the data from these three studies suggest somewhat of a decline in sex in public places. In the Omega cohort (1997), 44% of respondents reported that they had had sex in bathhouses in the six months prior to the study[73], which is somewhat higher than the proportions reported in the Vanguard study, but lower than that reported in VLAS.

Multivariate analysis of those in the Omega study indicated that bathhouse attenders were older (36 vs 31) and had a higher median income ($27,000 vs $17,500) than non-attenders. Univariate analyses indicated that during the six months prior to the study, attenders were more likely to have had more than one regular partner (8% vs 4%), more likely to report often having had anal sex with a regular partner while under the influence of drugs or alcohol (8% vs 3%), and more likely to use a condom when having insertive anal sex with a regular partner (72% vs 62%). A higher proportion of attenders had casual partners (100% vs 58%) and among those who had casual partners, the median among attenders was 14 compared with a median of one for non-attenders. Attenders were more likely to have had anal sex with their casual partners (53% vs 39%), more likely to often be under the influence of alcohol or drugs when having anal sex with casual partners (8% vs 2%), and were more likely to have had unprotected anal sex with casual partners (19% vs 7%). Attenders were more likely to report having ever had an STD. There was no difference between attenders and non-attenders in the proportion having anal sex at least once with a regular partner (70% vs 66%), in the proportion having unprotected anal sex with a regular partner (30% vs 32%), nor in condom use for receptive anal sex with regular partners (69% vs 63%). These results suggest that bathhouse attenders are at higher risk than non-attenders in that they are more likely to have casual partners, have more casual partner, and are also more likely to have unprotected anal intercourse with these partners[74]. It is not clear if the finding that bathhouse attenders are older is due to an age effect or to a cohort effect.

Risk behaviours of MSM who know they are HIV-positive

Two recent studies from the USA suggest that risk behaviour among MSM who know themselves to be HIV-positive may be an area of concern. Kalichman, Kelly, & Rompa, 1997[75], found that among those who knew themselves to be HIV positive, 33% reported unprotected receptive anal intercourse, and 22% reported unprotected insertive anal intercourse in the three months prior to the study. Robins et al. (1997) found that 25% of HIV-positive men compared to 38% of HIV-negative men had engaged in insertive anal intercourse in the six months prior to the study[76]. Neither study indicated whether or not respondents informed partners of their serostatus. Risk behaviour among those who know themselves to be HIV-positive has not been described in any available Canadian studies to date and this is certainly an issue that needs to be addressed.

Sex with an HIV-positive partner

Two Canadian studies discuss those who engage in sexual behaviour with people who are HIV positive. In the study done by Coates et al. (Toronto, 1984/1985)[58], recruiting was done on the basis of having had sex with an HIV positive person, therefore this study does not provide information on the percentage of MSM who have had sex with an HIV positive person. Of respondents in the Omega cohort in Montreal (1997), 36.2% report ever (lifetime) having oral sex with an HIV positive partner; 39% report ever having an HIV-positive partner (sexual activity not specified), and 5.9% report ever having unprotected anal sex with an HIV positive partner[70]. It is not specified whether respondents knew their partner's serostatus at the time of the sexual behaviour or if they found out later. Because of the potential for HIV transmission, more needs to be learned about the motivations underlying such behaviour.

Alcohol and Drug Use

Because an association has been observed between substance use and risky behaviour, this is an important area to consider. In the Men's Survey (1991), when asked reasons for not using a condom during the last episode of unprotected insertive anal sex and unprotected receptive anal sex, 17.9% and 13.5% respectively, reported that it was because they were using alcohol, and 9.2% and 6.2% said it was because they were using drugs. Comparing those who used alcohol prior to sex and those who did not, 23.4% and 14.9% respectively, reported unprotected anal intercourse. Similar results were reported for poppers with 28.3% of those who used poppers prior to sex and 18.3% of those who did not, reporting unprotected anal intercourse[65]. Of those in the Omega cohort who had a regular partner, 88% said they never or rarely used alcohol before sex, 12% said they used it half the time or more. Of those who had a casual partner, 9% used alcohol half the time or more before having sex[73].

Although alcohol and drug use have been associated with risky sexual behaviour, for prevention purposes, it should be noted that the relation between substance use and behaviour is not always a simple one of substance abuse causing the risky behaviour[77]. Consistent with this, there is evidence to suggest that sensation-seeking is correlated with alcohol and drug use as well as risky behaviour and when controlling for this variable, the association of alcohol and drug use with risk behaviour lessened or disappeared[78]. This finding suggests that it is important not to focus exclusively on preventing substance use but to also consider designing safer sex intervention programs which would especially appeal to those who are high in sensation-seeking.

HIV Testing Behaviour

Of participants in the Men's Survey (1991), 64.7% had ever been tested and of these, 18.2% knew they were positive, 1.7% did not obtain their results, and the remainder were negative[65]. Among those in the Alberta STD study (1994), 69.3% of MSM had ever been tested compared to

36% of those who did not report MSM. Of MSM who tested, 15.9% were positive, 12.6% did not know their serostatus, and the remainder were negative[29]. Among males reporting MSM on the CHM 1996, 71% had ever been tested, compared with 16.3% of those who did not report MSM[32]. HIV testing is not reported for the VLAS and Vanguard studies as subjects were recruited on the basis of not having a previous positive test and were tested as part of the study protocol.

These results suggest that a high proportion of MSM have been tested. However, as found in the general population, many of those tested were tested more than a year ago. In the Alberta study, of those tested, 38.6% had been tested in the year prior and 35% had been tested two or more years ago[29]. In the CHM 1996, of MSM who had been tested, 16% had been tested in the year prior, and 37% had been tested more than two years ago[19]. Although testing is important because theoretically it can lead to behaviour change which in turn reduces the risk of HIV-infection, in practice it is not clear how behaviour changes following testing. One study found evidence for increases in risk behaviour after receiving a negative result[79]. Furthermore, as mentioned earlier, risk behaviour among those who know themselves to be HIV positive has been reported. More needs to be learned about the temporal relation between testing and risk behaviour.

Discussion

Major observations and conclusions

A high number of MSM continue to engage in behaviours that place themselves and their partners at risk for HIV infection. These behaviours include unprotected anal intercourse, having multiple sexual partners, and unprotected sex with female partners.

Overall, it does appear that there has been some decline in the level of risk behaviour among MSM in Canada, particularly when comparing studies done in the 1980's with more recent studies. Comparisons within the VLAS and of the VLAS with the Vanguard study suggest that there has been some decline in the number of sexual partners, although no decreases are seen in studies conducted between after 1990. When comparing data from the 1980's, the early 1990's and more recent studies, it appears as though there has been somewhat of a decline in unprotected anal and oral intercourse. However, when looking only at the Vanguard cohort, there does not seem to be any decline in risk behaviour within the cohort, and, indeed, there was an increase in unprotected insertive anal intercourse. Given the relatively short time period of this study, however, it may be premature to comment on trends.

Condom use is less likely with regular partners than with casual partners. Given that many MSM have regular and casual partners, this suggests that prevention programs need to emphasize that it is only safe to have unprotected sex with a regular partner if both people have tested HIV negative and if the relationship is mutually monogamous.

The finding that many MSM have sex with women suggests that some women are at risk for HIV infection from bisexual males. Although this may translate to a relatively small number of women who are at risk by means of bisexual transmission, it is important that prevention programs convey this message.

Limitations of available data

Although an attempt has been made to identify trends in the data described in this paper, there are several difficulties involved. First, different studies often examine variables in different levels of detail. For example, some studies report on unprotected anal intercourse without distinguishing between different types of partners such as regular, casual and sex-trade partners. Furthermore, not all studies distinguish between oral intercourse with and without ejaculation. As well, as the variations in how particular behaviours are measured, varying time periods are used when inquiring about behaviour. Finally, although there have been several cohort studies on MSM, most are fairly recent, thus, it is somewhat early to assess trends in behaviour.

Because it is difficult to obtain random samples of specialized populations, such as MSM, and because recruitment and eligibility requirements for these studies vary, the levels of risk behaviours in the samples described here may not be representative of all MSM in Canada. For example, subjects who complete both baseline and follow-up questionnaires in cohort studies are possibly to be somewhat less likely to engage in risk behaviours than those who complete only baseline questionnaires [71]. On the other hand, levels of risk behaviour among those who are recruited through STD clinics might be expected to be somewhat higher than that of the general MSM population.

Specific data needs

There are a number of areas in which further information on risk behaviour among MSM is needed. Specifically, more needs to be learned about condom use with sex-trade partners, and condom use with female partners. As discussed earlier, the complex relationship between substance use and sexual behaviour needs to be more fully understood. A greater understanding of the sexual behaviour of those who know they are HIV positive, and of those who knowingly have unprotected sex with those who are HIV positive. More information is needed on specific factors related to HIV-risk behaviours. For instance, anecdotal evidence suggests that levels of risk behaviour are associated with age, with level of risk behaviour being higher among younger gay men than among older ones, however, most of the studies described have not provided information by age group. Such information needs to be collected and reported.

Ideally, cross-sectional studies of as randomly selected as possible samples should be conducted at regular intervals. This, along with the use of standardized questions, would increase generalizability, and enable the detection of any changes in levels of risk behaviour.

Table 22: Inventory of studies on HIV-associated risk behaviours among Canadian MSM			
Study and year of data collection	Investigators	Sample description and how recruited	Sample size
Vancouver Lymphadenopathy - AIDS Study (VLAS)[59,71]/ 1982 - 1988	Schechter MT et al.	through six general practitioners (N = 467 recruited in 1982-84, and took part in follow-up of 1987)	N = 467, 234 were 18-30 years of age when study began, remainder were over 30 years of age
Toronto study[58]/1984-1985	Coates RA et al.	Men who were partners of HIV positive men, 58.5% of these men were HIV positive as well	N = 246
Men's Survey [65]/1991	Myers T et al.	bars, bathhouses, community dances, cities across Canada	N = 4,803
Alberta STD Study[29]/1994	Romanowski B et al.	STD clinics in Calgary and Edmonton	N =505 MSM
Canada Health Monitor #13[19] (CHM)/1996	Division of HIV Epidemiology, Health Canada	telephone survey , general population, Canada wide	N = 3,123, 35 reported MSM
Vanguard study[60,61,64]/ 1995-1997	Schechter MT, Strathdee S et al.	community events and bars in Vancouver. aged 18-30, no previous positive HIV test	N = 603 as of August 1997
Omega cohort (Montreal)[73,74]/1996-1997	Alary M, Remis R, et al.	recruited through gay media, general media, within gay organizations, medical clinics serving MSM. 16 years of age and older, 35% under 30, no previous positive HIV test	N = 465 to date
Bisex Survey[66]/1997	Myers T et al.	bisexual males (those who had sex with at least one male and at least one female in the 5 years prior) were invited to call a 1-800 number through advertising in mainstream, community, and gay press	N = 1314

Table 23. Number of sexual partners among Canadian MSM		
Study	Five or fewer sexual partners	More than five sexual partners
VLAS[71]/in year prior (N = 234 who were 18-30 at time of enrollment)	24%	76%
Myers et al., 1991 [65]/in year prior	2.5% had no male partners, 16.6% had one, 34.1 had two to five partners	46.7%
Alberta STD study, 1994 [29]/in year prior	1.3% had no partner (sex of partner not indicated), 16% had one partner, 20.1% had two partners, 11.6% had three partners, 16.4% had four to five partners	34.6%
Vanguard [71]/ in year prior. 299 subjects who completed baseline as of July 1996, 286 had at least one partner	44%	56%
Omega 1996-97[73]/in six months prior	14% did not have a regular partner (sex of partner not indicated), 44% had one, 37% had two to five regular partners. 23% did not have a casual partner, 10% had one, 28% had two to five casual partners.	regular partners - 5%, casual partners, 40%

Table 24: Percent of Canadian MSM reporting unprotected and protected anal intercourse, by type of anal intercourse				
Study/Time period	condom use	receptive or insertive (not specified)	receptive	insertive
VLAS[71]/[1982-1984] (age 18-30) N =234 year prior to baseline for those who completed baseline	protected or unprotected		93% (at least once)	95% (at least once)
	protected			
	unprotected			
VLAS[71]/year prior to baseline [1982-1984] (age 18-30) (these data are for men who completed follow-up - did not include those who seroconverted, N = 100)	protected or unprotected			
	protected			
	unprotected		61% had a regular partner, 74% had a casual partner. Of those with a regular partner, 45% had at least one episode of. Of those with a casual partner, 8% had at least one episode[a]	Of those with a regular partner 44% had at least one episode unprotected with regular, 26% with casual
VLAS[59] 1984/1985 N = 358 (358 of 467 completed baseline and follow-up of 1984/85 and 1986/87/year prior	protected or unprotected		76% had at least one episode	
	protected		reported condom use ranged from never to usually, there was no always category	
	unprotected		of those who had RAI, 76.5% never used condoms	

[a] Only those who returned at follow-up were asked about condom use and this number was not provided. 61 men had a regular partner and 74 had a casual partner

Table 24 (continued): Percent of Canadian MSM reporting unprotected and protected anal intercourse, by type of anal intercourse

Study/Time period	condom use	receptive or insertive (not specified)	receptive	insertive
VLAS 1986/1987[59] N = 358 participants who completed baseline and two follow-ups (includes men who seroconvered during study)	protected or unprotected		56.1% had a regular partner and of these, 58.2% had RAI at least once with regular partner 80.2% had casual partners, and of these, 39% had RAI with casual partner	
	protected		condom use ranged from "never" to "usually", there was no "always use" category	
	unprotected		Of those who had a regular partner, 36.8% never used condoms, of those who had a casual partner, 7.1% never used	
Coates et al. 1984/85 [58] (Toronto) (not clear if "ever" or since 1978) N = 246	protected or unprotected		with primary case: 66.7% at least once with ejac. With partner other than primary case, 82.1% at least once with ejaculation[a]	72.8% with primary case. With other partners, 87.4%
	protected			
	unprotected			

[a] Percentages here are for total sample, not just for total having receptive or insertive anal intercourse

Table 24 (continued): Percent of Canadian MSM reporting unprotected and protected anal intercourse, by type of anal intercourse				
Study/Time period	condom use	receptive or insertive (not specified)	receptive	insertive
Men's survey, Myers et al (1991)[65]/prior three months	protected or unprotected	61.8% had anal intercourse at least once		
	protected	38.9% of total had protected only	36% of total sample report having had at least once with a condom. of those who report anal receptive, 71.7% always use a condom	44.3% of total sample had at least once with a condom. of those who report anal insertive, 68.9% always use a condom
	unprotected	14.5% of total had protected and unprotected, 8.4% of total had unprotected only	14.5% of total sample had at least once without condom. of those who report anal receptive, 11.5% never use	18.2% of total sample had at least once without a condom. of those who report anal insertive, 12.2% never use
Alberta STD Study, 1994[29]/ 12 months prior condom use data pertains to 76% of men who had male partners only (excludes bisexuals)	protected or unprotected	66% at least once	47% at least once	47% at least once
	protected	81% had regular partner, among these, 35.4% always used with regular. 77% had casual partner, of these, 51.9% always used with casual partner.		
	unprotected	24% never used with regular partner; 12.5% never used with casual partner.		

Table 24 (continued): Percent of Canadian MSM reporting unprotected and protected anal intercourse, by type of anal intercourse

Study/Time period	condom use	receptive or insertive (not specified)	receptive	insertive
Vanguard N = 299 who completed baseline, end of 1995[71]. 228 had regular and 256 had casual partner. (Year prior to baseline)	protected or unprotected		86% at least once	86% at least once
	protected			
	unprotected		of those with regular partner, 38% unprotected with reg at least once, of those with casual, 17% unprot with casual at least once	37% unprotected with regular at least once, 18% unprot with casual at least once
Vanguard [64]/year prior, N = 203, respondents who completed baseline and follow-up as of April 97	protected or unprotected			
	protected			
	unprotected	46%, 51% of total sample, at least once unprotected at baseline & follow-up, respectively	unprotected with regular (baseline, follow-up) - 29%, 34% unprotected with casual - 12%, 11% at least once [a]	unprotected with regular - 27%, 32%; unprotected with casual - 12%, 19% at least once [b]
Vanguard N = 603 who completed baseline as of August 1997[60] (percentage having at least one episode of unprotected in yr prior to baseline) 74% had a regular partner, and 79% had a casual partner	protected or unprotected			
	protected			
	unprotected	46% of those with a regular partner had any kind of unprotected anal sex with a regular partner. 26% of those with a casual partner had any kind of unprotected anal sex with a casual partner	74% had reg partner(s). At least one episode unprotected with regular partners, 33% w/o ejac, 25% with ejac. 79% had casual partner(s). 13% w/o ejac, 6% with ejac	at least one episode unprotected with a regular partner: 27% w/o ejac, 22% with ejac. casual - 15% w/o ejac, 9% with ejac

[a] Percentages for this study are of total sample

[b] Percentages for insertive anal intercourse at baseline and follow-up are significantly different.

Table 24 (continued): Percent of Canadian MSM reporting unprotected and protected anal intercourse, by type of anal intercourse				
Study/Time period	condom use	receptive or insertive (not specifed)	receptive	insertive
Vanguard [60] N= 285 subjects who completed baseline and follow-up as of August 1997. 223 had a regular partner, 216 had a casual partner	protected or unprotected			
	protected			
	unprotected		of those with a regular partner, 34.5% reported at least one incident at baseline, 44.8% at follow-up. Of those with a casual partner, 14.8% at baseline, 15.7% at follow-up	of those with a regular partner, 30% at baseline, 40.3% at follow-up. Of those with a casual partner, 14.8% at baseline, 23.6% at follow-up
Omega 1996-97[73]/six months prior	protected or unprotected			
	protected			
	unprotected (86% of sample had a regular partner, 78% had a casual partner)	of those with a regular partner, 31% at least once; of those with a casual partner, 13% at least once		

Table 25: Frequency of oral intercourse among Canadian MSM, by receptive or insertive, including data on condom use where available		
Study/Time period measured	Oral receptive (OR)	Oral Insertive (OI)
Coates et al., 1984/85[58]/time period not specified	with the primary case (HIV positive partner): 45.5% had OR in which partner ejac, 40.2% of total had OR in which swallowed ejac. With other partners: 74.8% had OR in which partner ejac, 67.9% of total had OR in which ejac was swallowed[a]	
Men's Survey, Myers et al., 1991 [65]/three months prior	81.7% has OR without ejaculation 29.3% had OR with ejaculation (protection not specified)	85.2% had OI (protection not specified)
VLAS[71]/year prior to follow-up Oct 86-Dec 87, (Those who were 18-30 at follow up) N = 100, does not include those who seroconverted	61% had regular partners,of these, 95% had unprotected OR with regular partner 74% had casual partners, of these, 94% had unprotected OR with casual	92% had unprotected with regular 83% with casual
Vanguard - for those who completed baseline as of July 1996[71], N = 299, 228 had regular, 256 had casual partner	97% unprotected with regular partner 95% with casual	95% unprotected with regular 89% with casual partner
Vanguard/ year prior. For 203 subjects who completed baseline and follow-up as of April 1997[64]	74% and 78% had unprotected with regular partner, (baseline and follow-up), 80% and 72% with casual [b]	76% and 77% unprotected with regular (baseline and follow-up);75% and 74% with casual

[a] Note these are percentages of total subjects, not just those reporting oral sex with ejaculation

[b] Percentages are of total sample

GENERAL DISCUSSION

Major observations and conclusions

Many Canadians are engaging in behaviours that place them at risk for HIV-infection and other STDs. Areas of concern include high levels of needle sharing among IDU, high levels of sex-trade activity among female IDU, unprotected anal intercourse among MSM, and unprotected intercourse between females and bisexual males. As well, more than half of adolescents are not using condoms consistently, and given their level of sexual activity, which is especially high among street youth, this is a very important area to monitor. Furthermore, although levels of risk behaviour appear to be lower among the adult general population than among other groups, substantial numbers are placing themselves at risk.

The finding that HIV testing is higher among MSM and IDU is encouraging evidence that those at high risk are being tested and counselled. It appears, however, that a large proportion of those who have been tested were tested more than a year prior to being surveyed, yet risk behaviours are reported as still occurring during a more recent time period.

Limitations of available data

Much of the difficulty in assessing trends is due to a lack of standardization in the operationalization of risk behaviour variables. Variables are not always clearly and consistently defined; for example, it is not always clear whether "sexual intercourse" includes oral or anal intercourse. The way in which condom use is assessed varies across studies. Some ask about condom use for the most recent episode of sexual intercourse, others ask about average use over a given time. The time period for which other sexual behaviour data is collected varies as well, with some studies inquiring about behaviours in the three or six months prior, others in the 12 months prior, and others over the lifetime of the respondent. There is no agreed-upon standard for the measurement of sexual and other sensitive behaviours, therefore this problem is likely to continue until such agreement occurs. The development and use of a set of standardized items to assess risk behaviour would be useful, but difficult to apply to cohort studies already in progress.

Samples from which data are collected may not be representative of the relevant populations. This may be especially true in the case of MSM and IDU, two populations that are difficult to access and survey in a representative manner. For adults in the general population, it is not clear how those who are willing to take part in telephone surveys differ from those who refuse to take part. In the case of adolescents, most surveys have been school-based and those who attend school less frequently are more likely to be missed on these surveys.

Specific data needs

There are a number of areas where more information is needed. First, and most important, is the issue of condom use. Because condom use can prevent HIV infection among those engaged in otherwise risky behaviours, it is a very important behaviour to understand and monitor accurately. There are problems interpreting information on condom use, however. Although few would deny the significance of condom use with casual partners, it is more difficult to estimate the risk behind failure to use condoms with regular partners. If the term "regular partner" implies two people who have been mutually monogamous for many years, or two people who have been mutually monogamous for a shorter time but have both tested negative for HIV-antibodies, then lack of condom use would not be considered unsafe. However, if the two people have been involved in the relationship for a short time and one or both of them have not been tested, then failure to use condoms would be a risk factor for HIV. Most studies however, do not distinguish between short-term regular partners and long-term regular partners. Nor do they inquire in detail about HIV-testing behaviour. Accordingly, within the general population, it is difficult to draw conclusions about the risk of not using condoms between regular partners. In addition to information about the nature of regular partnerships, more information is needed on how condom use varies for vaginal versus anal intercourse. Many studies inquire only about condom use for intercourse, without distinguishing between anal and vaginal intercourse. Given that there is evidence condom use is less likely with anal intercourse than with vaginal intercourse, and that HIV transmission is more likely with anal intercourse, this is a serious concern.

More needs to be learned about the temporal relation between HIV testing and behaviour change. It is not known how behaviour changes after negative test results or after positive test results, nor is it known if behaviour changes in response to the decision to seek an HIV test. Studies which assessed testing behaviours and risk behaviours on a regular basis over a reasonable length of time such as one or two years could be very helpful in answering these questions.

Two other areas in which information is needed are important to mention. First, although information is available on adolescents in school and street youth, there is little information available on adolescents who do not attend school but are not living on the street. Second, although most studies inquire about number of sexual partners, in the case of those who have had more than one partner, very little information has been collected on whether these partnerships are serial or concurrent. The potential for HIV transmission is clearly greater in concurrent multiple relationships.

Many behaviours such as injection drug use, same-sex activity, and commercial sexual activity are reported by only small proportions of the general population. Nevertheless, it is important to monitor these behaviours in order than any increases are detected. Similarly, it is important that we consider whether or not we are missing important behaviours. For example, although many general populations surveys inquire whether men have paid for sex and whether women have been paid for sex, it might be important to ask if women are paying for sex or if men are being paid for sex.

Finally, studies about sexual networks are needed to provide information about the mixing of different populations. This type of qualitative information, together with the regular standardized collection of the type of quantitative data presented in this report, would form a powerful analytic platform to guide and evaluate Canada's HIV prevention programs.

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